



THE GOOD, THE BAD AND THE UNEXPECTED:

The user and the future of
information and communication technologies

A transdisciplinary conference organised by

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"Participation in the Broadband Society"

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Conference proceedings

Volume I

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Call for Papers

Introduction

The main objective of the conference is to create new knowledge about users' creativity and facilitate their empowerment in a broadband information society. This knowledge is crucial in order to strengthen the European Research Area. Moreover, this requires an examination of the factors that can both constrain and enhance users' abilities to shape and use ICTs.

From our perspective, the 'broadband society' refers to a possible, but not inevitable, substantial transformation of our experience of telecommunications based on these technologies allowing information and communication technologies to be used everywhere, all the time and by everybody. Given the widespread aspirations of Governments and companies to achieve this goal, the extent to which any such transformation has occurred needs, of course, to be evaluated in a balanced manner.

Broadband technologies have resulted mainly from technological and institutional imperatives. To what extent have potential users managed to find ways in which such technologies can be useful, worthwhile and attractive? We certainly know from previous research this can require those users to be creative in terms of fitting ICTs into their activities or using them to find solutions to the everyday problems that they already encounter. But how much is being demanded of those users, what considerations have a bearing upon whether these technologies actually find a place in their lives and what new issues, of indeed problems, can these ICTs themselves create, especially if they really are 'disruptive technologies'? Ultimately, we also need to acknowledge that users may well decide that their existing solutions suffice, in which case these new technological options may find only a modest place in their lives. Indeed, they may even be resisted or ignored. Whatever strategies users employ for assessing and dealing with such innovations, we need to learn more about these social processes, including strategies for dealing with the up and coming generation of new information and communication products and services. Only by so doing can we hope to empower them further in their relationships to technology and through this hope to increase the quality of their lives.

In this conference, the organisers - COST Action 298 - invite technology and product developers, designers, social scientists, policy makers, community representatives and others who are interested in the conference topics, to join our attempt to develop this discussion on a common, shared and transdisciplinary ground. We ask participants to

- 1) strive to present their topic from a human-centric point of view as opposed to a technology-, product- or business-centric one, and to
- 2) present their topic in a language that attempts to transcend disciplinary boundaries, a language that non-experts can also understand, and to
- 3) not only report on their work, but also to engage in the conference debate which aims to develop ways to understand the interests of people and society, to evaluate developments against such an evolving understanding, and to chart interesting and desirable future directions.

The emphasis of this event will be on networking and promoting a dialogue with colleagues from around Europe and the rest of the world.

We look forward to seeing you in Moscow for a conference designed to be exciting, thought-provoking and challenging.

Organizers

This conference is organised by the COST 298 network 'Participation in the Broadband Society', the successor to COST actions 269 and 248. The conference is a follow up to the conference The Good, the Bad and the Irrelevant held in Helsinki in September 2003. COST 298 is an action in the domain 'Information and Communication Technologies' of COST, an intergovernmental framework for European Co-operation in the field of Scientific and Technical Research. In COST 298 European scientists from telecommunication research departments, universities and operators together with independent consultants collaborate in cross-disciplinary

groups to analyse the social dimensions of people's relationships to information and communication technologies.

Additional sessions (about online politics) are co-organized by COST Action A30, which is concerned with establishing a new media research agenda for East and Central Europe and by COST Action 294 (MAUSE: Towards the MAturation of Information Technology USability Evaluation).

Programme

The conference will be organised around four strands. Besides these, three sessions and two panels are devoted to special themes:

1. Users as innovators

Within the changing techno-economic paradigm, the user is increasingly seen as the origin of innovation. This refers to strategic roles like 'lead users' or 'pro-am' in technology design. At the same time powerful Web 2.0 tools (blogging, social software, folksonomies, etc) enable an affluence of 'user generated content' (UGC) based on the 'networked individualism' of people. However the user as innovator also refers to more tactical roles. Users of ICTs have often used technologies in very creative, sometimes unanticipated, ways. This refers to ways in which ICTs either enable or constrain users' ability to develop innovatory social practices, linked to technology design and content creation. What factors lead to creativity in the use of ICTs? In addition, how people make choices is a key issue. While choice behaviour asks for active informed decision-making, people in practice are often not interested in making such active choices. Therefore, what enablers and constraints play a role in this process? How useful are theoretical frameworks in explaining such choices?

This strand will look at patterns of behaviour during diffusion, users' innovation, technology design, the ways users make choices to use or not use broadband technology, taking note of the fact that at a certain moment in time any innovation is simply less 'innovative'. When, if ever, will broadband become the 'norm' and does it really matter for users? How long does it take before an innovation is regarded as being domesticated and what does this mean in practice? Finally we also welcome contributions on methodological innovation for investigating users as strategic and tactical innovators. This includes methods that enable understanding and interpretation of users' creativity in everyday life, like ethnography, persona development or research in living lab settings.

2. Humans as eActors

This strand welcomes theoretical, methodological and empirical contributions to the following areas:

The electronic portrait of individuals as human actors

What type of electronic information do people deal with and how? Given that humans use, produce, store, disseminate and retrieve information, these particular processes have to be studied in order to understand the production of the electronic self and its social consequences. This portrait should also address the evolution of human self-determination, autonomy and reflexivity regarding more pervasive (or invasive) information and communication systems.

The convergence of social and technological processes around the human body

This area involves analysis and studies of the convergence of several social and technological processes around the human body. What are the relevant debates about this development and what are the social representations of the human body in a broadband society?

An anthropocentric perspective in developing interfaces that are user pulled rather than technology pushed

Any anthropocentric perspective requires us to reflect upon the end user as being main target, beneficiary and 'raison d'être' of ICTs, including the ones mentioned in visions of the broadband society.

Migrants and their social integration and cohesion in the European broadband space.

During the last few years there has been a lot of turbulence in the European scene. The European union was confronted with a great number of new members, discussions take place of how large the EU may or cannot be, what does 'European' mean when thinking about spacial and cultural boundaries. The French and Dutch 'no' to the European constitution were for a large part the result of this discussion. In the public opinion migrants are often looked upon as at least 'problematic'. ICT's could play an important role in the integration both politically and socially of migrants in their new surroundings. On the other hand ICTs are means to keep in touch with the native country or region from which they emigrated.

This area involves any theoretical and empirical discourses on the social and political integration of diasporas in their new country involving the use of ICTs. It also addresses the question of the ways in which the use of ICTs supports cultural and social relations within diaspora communities.

3. The multiple cultures of the Information Society

Although there are now a limited number of cross-cultural comparisons of the experiences of ICT use, it is quite clear that there are complex issues involved in making sense of international differences, as well as differences within national cultures. While we welcome papers at the conference that focus specifically on cross-cultural issues we want to encourage a wider engagement in this issue. This strand invites people conducting national research on ICT adoption and use to report on that work. But we would like them to add what they think might be cultural or national influences shaping these developments in their country. For example, if studies focus on gender or age groups (such as youth, the elderly) we would ask researchers to consider how people's experiences are influenced by national or regional circumstances (educational, legal, employment, financial, time structures, domestic division of labour etc.) or particular meanings and values in that culture. There is a workgroup within COST 298 that is looking at this whole area of cross-cultural comparisons. We hope to build on the reflections from the papers in this strand and develop our thinking with a view to producing a coherent publication based on these contributions.

4. Future directions

Both the technological environment and wider society are evolving through a process of mutual interaction. Even if we accept that the results and acceptance of technological developments in society cannot be reliably predicted, it is also clear that vast investments are being made in the intentional development of technologies, including broadband technologies, with certain aims and strategies. These are inevitably based on certain sets of assumptions about the future. In fact, all such future-oriented action is based on some kind of a vision about the future, whether it is explicitly articulated or not. These intentions and assumptions have a great influence upon the whole development agenda, the specific development processes, and the results of these endeavours.

This strand will explore the process of this kind of vision-creation and aims to intentionally, and indeed proactively, contribute to this envisioning process in society. This is important for the way in which any information society develops, as well as for achieving better efficiency in technology investment.

5. Special sessions and panels:

- Politics Online: Comparative Perspectives, Theories & Methodological Innovations (co-organized by COST A30 & COST 298)
- Accessibility for all to services and terminals (co-organized by COST 219ter & COST 298)
- Semantic multimodal analysis of digital media (co-organized by COST 292 & COST 298)
- ICTs and China
- Gender in a broadband society

Venue

The conference will be hosted by the Academy of National Economy under the Government of the Russian Federation. The local organizer of the conference is the Institute of the Information Society (Moscow, Russian Federation).

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Users as innovators

Africa's Rural Communities as Knowledge Prospecting Domains for emerging e-Business Models

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Abstract

The research reported in this paper is part of a longitudinal study on the concept of Knowledge Prospect Domains (KPD). It is an attempt to discern its applicability to characterize African rural communities (ARC) in an e-Business environment, thereby depicting them as a structured entity from where knowledge could be extracted for emerging e-Business models. By describing African Rural Communities as KPD, and seeking alignment to *emerging technologies*, *adaptive technologies*, convergent with *proprietary technologies*, will be created that could lead to the discovery of new e-Business models. The literature promotes the notion that a business environment characterized by rapid, radical and discontinuous change requires *adaptive technologies*, *human creativity* and *sense making* to work hand in hand in *creating new reality* and subsequently new business models. It will be argued that rural communities with its own set of complexities could be realized as a rich source from which knowledge could be appropriated for the innovation of novel business models. Most e-Business systems that are developed on traditional scientific, engineering and business principles - to serve a well defined set of processes and information flows required by modern business systems - are sometimes in complete cognitive dissonance with human social reasoning processes and needs. Pertaining to these perceptions some use will be made of social construction theories, like *technological determinism*, *social construction of technology (SCOT)* and *social shaping of technology (SST)*.

From the research, descriptors will be proposed to profile African rural communities, focussing on their derived needs, matching them to available/emergent technologies and investigating the e-Business interface. The research shows that despite the perception of tranquillity, stagnation and fossilization, attributed to rural societies, they find themselves in the KPD of Boisot's I-Space and are therefore compliant with so-called Schumpeterian-Learning (S-Learning) as compared to Neo-classical-Learning (N-Learning).

The hypothesis predicated in this paper is that, if African rural societies are constructed as KPD, then valuable knowledge will be extracted that can be utilized for the innovation of sustainable e-Business models.

The pretext for constructing KPD is for business model innovation (BMI).

Key words: *knowledge prospect domains, African rural societies, mobile technologies, emergent technologies, disruptive technologies, e-Business models, socio-informatics, pecuniary dynamics and cyber money*

Introduction

The double influence of the spirit of commerce and the gospel of Christ has given an impulse to the circulation of men, ideas and commodities over the face of the earth, and the discovery of the gold regions has given enhanced rapidity to commerce in other countries and the diffusion of knowledge. But what for Africa? God will do something else for it. Something just as wonderful and unexpected as the discovery of gold. David Livingstone [c. 1853]

When researching the extant literature and current publications on the bush-fire like spread of mobile telephony into Africa one gets the perception that this might be the unexpected *discovery of gold* that Africa has been waiting for. Headlines such as *Rural Africa new frontier for mobile phone boom; Demand rages among rural folk; Mobile operators scrambling to gain foothold in Africa; Africa's cell phone boom creates a base for low-cost banking;* and commitments like *MTN budgets R700m for rural telecoms; MTN is rolling out more than 300 3G base-stations; Over 5 years, each cellular operator is obliged to distribute 2.5 million SIM card packages and provide 125 000 cell-phones.....;* present sufficient evidence to support this perception. At the same time an abundance of new ways to do business, new ways to offer community services and new ways to inject economic-agrarian sustainability are discovered. Most of these novel ways of doing things are based on specific knowledge extracted from which could be called *ill-prospected* African rural communities.

The working hypothesis that will be followed in this research is that, if African Rural Communities (ARC) are constructed as Knowledge Prospect Domains (KPD)¹, then valuable knowledge will be extracted that could be utilized for the innovation of sustainable e-Business models.

The research report is part of a longitudinal study². It will be an extension of previously published research by the author on the concept of *Knowledge Prospect Domains* (KPD). It will furthermore attempt to demonstrate the *praxis* of the concept/construct KPD in ARC.

Re-Visiting The Concept Of KPD

In previously published work Knowledge Prospect Domains (KPD) was proposed as: *those areas where embedded/embodyed knowledge, not yet being exploited/extracted by conventional technological means from e-business systems like data processing and data mining, could be extracted by sense making, communities of practice and intervention techniques (creative abrasion) integrating human and machine intelligence in a prospecting rather than mining mode; a domain where experimentation, scanning the edge of chaos, using creative-destructive-learning and system integration will lead to anticipated surprise; where prospecting for mineral wealth – knowledge discovery – precedes mining for gold – knowledge utilization.*

The pretext/context in which this was formulated was that of the immediate operating area of e-Business systems where convergence between *proprietary* and *emergent* technologies became visible and *dominant designs*³ predicated future business and technological developments. This argument held for developed urban societies and mature business processes. It will be argued that this conceptualization could also be transposed onto African rural communities (ARC) where convergence of mobile technologies and the emergence of new business models are being significantly reported in the extant literature. To support this reasoning, the concept of KPD will be adapted from the generic to the specific in order to embrace ARC as KPD, albeit from a different paradigm. It is proposed that the notion of

¹ Botha, Daniel F. 2006. 37-43.

² Botha, Daniel F. 2007

³ Weick, K. 36

communities of practice in the ARC context be considered to include *user communities* as knowledge prospects regardless if these communities are constituted formally or informally.

The next section will attempt to utilize social construction theory as a broad framework for positioning ARC in context of emerging technologies. This will be followed by two sections, one focussing on establishing relevant African social descriptors and the second on the relationship with mobile telephony and associated technologies. Subsequently a brief overview of the concept of e-Business models will be given followed by the proposal of constructing ARC as KPD. Finally a multi-factor regression equation for an empirical research model for future research is proposed.

Some Social Construction Theories

A brief discussion of social construction theories – specific emphasis on technology - will be presented, with the aim of using it as a broad framework for constructing ARC as KPD. *Social constructionism* can be defined as, *analysis of knowledge or reality, or both, as contingent upon social relations, and is made out of continuing human practices... ..the analysis of the structure of the common-sense world of everyday life.*⁴ Three mainstream theories on linking social construction to technology, namely, *technology determinism*, *social construction of technology* (SCOT), and *social shaping of technology* (SST) are discussed.

*Technology determinism*⁵ is a reductionist doctrine that a society's technology determines its cultural values, social structure, or history. Technological determinism has been summarized as; 'the belief in technology as a key governing force in society' (Merritt Roe Smith⁶); 'the belief that social progress is driven by technological innovation' (Michael L. Smith); 'the belief that technical forces determine social and cultural changes' (Thomas P. Hughes); and 'the idea that technological development determines social change' (Bruce Bimber). Most interpretations of technological determinism share two general ideas:

- That development of technology itself *follows a path* largely beyond cultural or political influence, and
- That technology in turn has *effects* on societies that are inherent, rather than socially conditioned

To some extent this theory holds for ARC. Mobile technologies as such, from a pure technical viewpoint, did not emanate from these communities. But is this conclusive?

Technological determinism stands in opposition to the theory of *social construction of technology* (SCOT). Leading adherents of social construction of technology like Wiebe Bijker⁷ and Trevor Pinch⁸ argue that technology does not determine human action, but rather, human action shapes technology. They also argue that the ways in which a technology is used cannot be understood without understanding how that technology is embedded in its social context. It holds that both the path of innovation and the consequences of technology for humans are strongly, if not entirely shaped by society itself, through the influence of culture, politics, economic arrangements, and the like. SCOT is a response to *technological determinism*. If it is argued that e-Business models are *the methods, theory, and practices*

⁴ Honderich, T. 829

⁵ Staudenmeier, S.J., & John M. 134-148.

⁶ Smith, Merritt Roe, & Leo Marx, eds.

⁷ Bijker, Wiebe E., Thomas P. Hughes, & Trevor J. Pinch, eds.

⁸ Pinch, Trevor J. & Wiebe E. Bijker. 347-360.

*governing such applications*⁹ and that these models came about because of, and not despite of, ARC then the theory of SCOT holds for ARC – *the path of innovation shaped by society*.

Yet another view is that of *Social Shaping of Technology* (SST)¹⁰ where the central concept is that there are choices – though not necessarily conscious choices – inherent in both the design of individual artefacts and systems, and in the direction or trajectory of innovation programs. If technology does not emerge from the unfolding of a predetermined logic or a single determinate, then innovation is a ‘garden of forking paths’. *Different routes are available*, potentially leading to *different technological outcomes*. Significantly, these choices could have differing implications for society and for particular social groups. SST both agrees and conflicts with elements of other theories that tie sociology and technology together such as SCOT and Technological Determination (TD). SST is concerned to explore the material consequences of different technical choices, but criticises TD, on its argument that technology follows its own developmental path, outside of human influence, and in turn, influences society. From the evidence gathered it will become clear that SST is applicable to ARC contrasted against other communities like urbanized societies – *different routes available, different technological outcomes and differing choices*.

African Rural Communities Descriptors

It is now deemed necessary to present some grounded framework against which ARC structures could justifiably be described. For this purpose the globally recognized DARE¹¹ program was found to be a credible choice from which the following definitions, in the context of ARC, was found to be of significance¹²:

- *De-agrarianisation* is defined as a long-term process of occupational adjustment, income-earning reorientation, social identification and spatial relocation of rural dwellers away from strictly agricultural-based modes of livelihood.
- *Depeasantisation* represents a specific form of de-agrarianisation in which peasantries lose their economic capacity and social coherence, and demographically shrink in size. They literally unravel as communities.
- The new *Sustainable Rural Livelihoods*¹³ (SRL) approach is a response to the complexity of rural livelihoods and their growing non-agricultural character

There has been a reluctance to consider how neo-liberal policies impact on African rural social structures. Rather the tendency has been to see African social institutions, especially those associated with rural peasant societies, as *constraints* to the implementation of economic policies, inferring that vested interests and traditional conservatism cannot rise to the market challenge. DARE argues the opposite – African peasant societies have been extremely responsive to neo-liberalism with as yet unclear implications for the social and economic fabric of African countries. The examples of mobile and related technology adoption in ARC, that will be used as research data, provides further support to the arguments of DARE; arguments which is predicated for this paper.

⁹ One of the definitions of *Technology* from Collins concise dictionary.

¹⁰ Williams & Edge. <http://www.rcss.ed.ac.uk/technology/SSTRP.html>

¹¹ DARE – De-agrarianisation and Rural Employment research program at the African Studies Centre, University of Leiden, funded by the Dutch Ministry of Foreign Affairs (DGIS)

¹² Bryceson, D. F. 2000, 12

¹³ Bryceson, D. F. 1999

Rural restructuring factors¹⁴ characterized by: peasant's deteriorating commercial agriculture; rising cash needs; increasing income diversification (the upsurge in non-agricultural income diversification represents large-scale agrarian labour displacement within an accelerated process of depeasantization); proliferation of income earners within the rural household; decreasing rural isolation; diversification and class differentiation are robust descriptors for the complexity, uncertainty and diversity in ARC. This makes ARC according to Boisot¹⁵ a *regime bordering on chaos* (a chaotic regime) and therefore fertile for purposes of knowledge discovery (new insights), one of the conditions to satisfy the definition of KPD. In this regime, *scanning* (one of the six phases in Boisot's I-Space¹⁶), for new business models becomes paramount. It is predicated that this evidence be used in the attempt to qualify ARC as KPD.

Furthermore in coping with uncertainty, specific *tensions within African peasantries* could also be cited to bear on the argument that ARC can be considered KPD. Four tensions identified by DARE¹⁷ are appropriated:

- Securing economic survival: market experimentation versus subsistence fallback
- Marshalling resources and social networks: household solidarity versus individual autonomy
- An unacknowledged identity crisis: agrarian conservatism versus sceptic otherness
- Strengthening or weakening the economic foundation of rural livelihoods? Linkages between non-agricultural activities and agriculture

If it is accepted that uncertainty should be confronted with capability, it should also be acknowledged that the future of African rural dwellers lies increasingly in labour force participation outside of rural agriculture. It signifies that some other commercial cash-generating activities should be realized. This is where mobile technologies can make a significant difference. The need is for literacy, numeracy, knowledge of the national language, and various occupational and computer skills that will provide the means to command sufficient income for themselves and their families, as well as to raise the overall level of productivity in their respective countries. Confronting uncertainty with capability presents a *capacity to act* and therefore, an abundance of e-Business model opportunities. Capability enhancement through human capital investment is therefore vital.

The upsurge in non-agricultural income diversification which has taken place on the African continent during the last fifteen years represents large-scale agrarian labour displacement within an accelerated process of depeasantization¹⁸. One way to combat this trend is to accelerate the cash flow into these peasant communities; this could be called *the pecuniary dynamics of ARC as KPD* in which mobile technologies are already playing a multiplier role.

The following extracts from publications highlight the pecuniary descriptors of ARC: *Mobile phones have the ability to make a dramatic change to village life in Africa; One of the most exciting areas is in making social transfers to the very poorest in society; The mobile phone is creating niches that Africa's poor entrepreneurs are able to exploit in new ways; When ever an opportunity appears, however obscure, someone will move to exploit it within days; Mobile payments can also facilitate transactions in remote areas and can even improve security by removing cash from the business process altogether; Several studies show that, once the*

¹⁴ Bryceson, Deborah. 2000, 3

¹⁵ Boisot, M. 39

¹⁶ Boisot, M. 41

¹⁷ Bryceson, Deborah. 2000, 7

¹⁸ Bryceson, D. F. 1999

inertia of cash has been taken away, an economy will start taking off and accelerating; With over 3 million transactions a month in the DRC alone, Celpay recognises the need for leading mobile banking solutions in emerging cash-based economies; additional features and functionality for customers, including inter-bank transfers and enhanced airtime vending; Most operators sell airtime in tiny denominations for people who live from hand to mouth; Celpay Zambia upgrades technology to directly answer African population requirements; and The venture hopes to build on the rapid spread of pre-paid cell phones to create a whole new banking system, one designed for low income users that have been under-served or ignored by traditional banks. These are but some of the cases that can be reported on where rural Africa has some unique requirements for the use of cyber-money.

From the cases that was perused it can be credibly proposed that the following *cash flows streams* (X_{cfs}) characterizes ARC: Money transfers from *urban to rural* areas where relatives are the beneficiaries (X_{u2r}); income from non-agricultural peasant-like industry (X_{nai}); income from sustenance and small scale commercial farming (X_{scf}); income from state social funds (X_{ssf}); and, income from international and non-governmental organizations aid funds (X_{aid}). These factors are the independent variables to describe the dependent variable X_{cfs} which will be used as some of the indicators to describe ARC as a PPD.

Mobile And Associated Technologies In The African Context

Once a powerful technology exists and is known to exist, a productively powerful society without much of a market also becomes possible. Whether it then inevitably engenders a hidden market (the double economy), or networks of reciprocity, is an interesting question¹⁹.

Mobile phones are the very first technology in history where there are more now being used in the *developing world* than in the *developed world*²⁰. Mobile phones have the ability to make a dramatic change to village life in Africa. One of the most exciting areas is in making social transfers to the very poorest in society

Most of the World's *Developed Communities* migrated from the large screen of the PC to the smaller screens of the laptop/notebook and PDA and lately to the still smaller screen of the mobile phone whilst over the same time-line computing power (memory and micro-processor speed) tracked the migration, i.e. recent mobile phone computing power is now virtually equal to that of earlier/legacy PCs. It is of significance to note that some *Developing Communities*, of which Africa is the most prominent, did not follow this migration but are taking a technology leap, closing the digital divide, and having their novel digital world experience directly on the small screen; if the mobile is going to become Africa's PC this calls for a serious new way of thinking about business models and *pecuniary dynamics*. Add to this, *mobile internet access*, *NFC technology*, and *smart- and scratch-card* applications, you have the *requisite variety*²¹ that could evoke a multitude of business models and opportunities.

Various *contact-less* payment systems rely on technology called *near-field communication* (NFC), short exchange of data, when machine induces an electrical circuit in the NFC device. This technology is embedded in *contact-less plastic cards*²² – both in and out of phones making it easier to use for small payments.

¹⁹ Gellner, Ernest.

²⁰ Economist.com. March 5th 2007.

²¹ Weick 89

²² Economist.com. Feb 15th 2007.

The well known *scratch-card*, mainly used in the lottery business, found a new application in the African context; the simplicity of this novel business model design speaks of elegance. You simply buy a \$5 scratch card, scratch of the panel to get the voucher number and then text that number to your counterparty. Compare this to using a UK internet bank account to send 5 pounds from your account in London to a friend in Edinburgh: if you are lucky it will take three days and it may take four.²³ A number of mobile operators in Africa have developed electronic versions of this mechanism - the *scratch-card solution* – by allowing the direct transfer of airtime from one person to another, thus hugely improving liquidity of this ‘currency’. There are initiatives in countries such as Kenya and South Africa working to capitalize on this gap in the market by providing payment services matched to the needs of the poor and un-banked. Phone-to-phone (P2P) transfers²⁴

Connectivity could become a kind of currency as we move forward in the on-line world. Mobile phone minutes are just another currency²⁵ Air-minutes like air-miles are becoming redeemable currency.

From this it could be inferred that ARC have a significant potential of adopting emerging technologies (X_{act}) into their rural livelihoods which leads to the innovation of unique sustainable e-Business models (X_{seb}). These business models subsequently affect the sustainability of these livelihoods (X_{srl}).

e-Business Models

Developers and business analysts who build complex structures or systems have been creating models of what they build. The term *model* could be defined as an abstract representation (*cognitive simplification*²⁶) of the real world that reduces complexity and represents only the details necessary for a specific purpose.

From the literature²⁷ three types of definitions for *business models* could be identified:

- Business model definitions that concern themselves with the *participants in a joint business venture*; models that specify the relationships between different participants in a commercial venture
- Business model definitions that concern themselves with the *process and structure of a business organization* that should be in place to operationalize the strategy of the business.
- Business model definitions that concern themselves with how business models are *seen from the perspective of the market place*.

Researching the literature for a single definition on the concepts of *e-Business* and *e-Business models* proved rather daunting. The use of the letter “e”, supposedly denoting *electronic*, could be largely the cause of the confusion. Although there seems to be some converging consensus on the term, *e-Business systems*, denoting business application architecture running on generic IT-infrastructure, many authors still regard e-Business as being exclusively *Internet based* and mostly B2B. The latest publications on the subject by noted authors such as Laudon & Traver²⁸, O’Brien²⁹, and Papazoglou & Ribbers³⁰, to name but a few, recognize that non-

²³ Birch, David.

²⁴ Birch, David.

²⁵ Birch, David.

²⁶ Boisot, M.

²⁷ Papazoglou, M.P. & Ribbers, M.A.

²⁸ Laudon, K. & Traver, M.

internet-based emerging technologies, when integratable with internet-based proprietary technologies be acknowledged as part of e-Business systems and therefore e-Business models. This line of reasoning will be followed in this paper, as previously argued by Botha³¹. Business models emanating from the KPD of ARC satisfy the definition of the 3rd kind above namely, *from the perspective of the market place*, and will be considered to be internet- and non-internet-based stand-alones and hybrids.

Constructing ARC As A KPD

Superimposing the evidence presented above on the definition of KPD and by seeking a comparative goodness-of-fit with key phrases/constructs of the definition the following deductive inferences can be supported/made:

- *Knowledge not yet been extracted by conventional technologies*: Knowledge-based technologies, such as data-mining, are conventionally used to extract new knowledge from e-Business system operations. The knowledge that led to the advent of emerging disruptive technologies and their accompanying simplistic business models came from *sense-making*³² (scanning, cue extraction, interpretation, enactment) and communities of practice/users, integrating human intelligence with machine capability in a prospecting – exploring *requisite variety* - mode.
- *Creative-destructive learning*: It could be argued that statements in the literature on the application of emergent technologies in ARC such as: ‘Bank branches and post offices are these days as *redundant to financial systems* as copper wire and telegraph poles to telephony’³³; ‘But, the new systems could prove to be a *disruptive technology*. Banks could be *disintermediated*’³⁴; and, ‘Never mind the \$100 laptop the mobile phone is already Africa’s PC, and is having significant socio-economic effects’³⁵, supports this concept.
- *Communities of practice/users*: Mobile phones have the ability to make a dramatic change to village life. Mobile phones are the very first technology in history where there are more now being used in the *developing world* than in the *developed world*³⁶.
- *Creative abrasion*: ‘Celpay³⁷ is a truly innovative company which saw the issues that customers had with banking access and implemented solutions, a number of years ago, that directly answers the requirements of the population.’ ‘The key point to note is that the average cost per transaction significantly lowers as volumes increase with an electronic system.’
- *Sense-making*: ‘Celpay is a truly innovative company which saw the issues that customers had with banking access and implemented solutions, a number of years ago, that directly answers the requirements of the population. ‘We know from our experience in other countries that mobile phones are ideal tools for transacting, and we also know that transaction volumes will grow rapidly once adoption starts. Mobile payments can also facilitate transactions in remote areas and can even improve security by removing cash from the business process altogether’³⁸

²⁹ O’Brien, J. & Marakas, G.M.

³⁰ Papazoglou, M.P. & Ribbers, M.A.

³¹ Botha, D.F. 2007.

³² Weick 49-55

³³ Economist.com. March 5th 2007.

³⁴ Economist.com. Feb 15th 2007.

³⁵ Birch, David.

³⁶ Economist.com. March 5th 2007.

³⁷ FUNDAMO-On-line News letter.

³⁸ FUNDAMO Newsletter.

- *Integrating human and machine intelligence*: The rapid adoption of mobile technology into village life created, *occasions for sense-making*³⁹ that led to new business models never conceived before as viable in urban communities. ‘The mobile phone is creating niches that Africa’s poor entrepreneurs are able to exploit in new ways; When ever an opportunity appears, however obscure, someone will move to exploit it within days’⁴⁰ is but one example that supports this perception.

It is proposed that the salient factors/cases as described above are sufficient evidence to construct ARC as KPD. It is furthermore predicated that SRL – the dependent variable factor - will be directly proportional to sustainable e-Business models (SEB) and sustainable social services (SSS). SEB in turn will be dependent on cash flow streams (CFS), technology development (TDV) and rate of adoption of emergent technologies (AET) – the latter three then being the independent variables or indicators.

Proposed Research Model

The hypothesis supported by the evidence presented above can now be described by the following multiple regression equation: (This equation describes the KPD for ARC)

$$Y_{srl} = a + b_1X_{seb} + b_2X_{sss} + e$$

Where:

Y_{srl} = variance in sustainable rural livelihoods (SRL)

X_{seb} = variance in sustainable e-Business models (SEB)

$$= c_1X_{cfs} + c_2X_{tdv} + c_3X_{aet} + e_1$$

X_{sss} = variance in sustainable social services (SSS-health, education & infrastructure)

X_{cfs} = variance in cash flow streams (CFS)

X_{tdv} = variance in technological development (TDV)

X_{aet} = variance in adoption of emergent technologies (AET)

$b_1, b_2, c_1, c_2,$ and c_3 are the regression coefficients of variables Y and X, a the constant for the null-hypothesis, and $e = e_1 + e_2$, the constants of random error.

Furthermore X_{cfs} can be described by:

$$X_{cfs} = d_1X_{u2r} + d_2X_{nai} + d_3X_{scf} + d_4X_{ssf} + d_5X_{aid} + e_2$$

Where X_{u2r} = variance in money flow from urban to rural

X_{nai} = variance in non-agrarian income

X_{scf} = variance in subsistence and commercial farming income

X_{ssf} = variance in state social funds flow

X_{aid} = variance in income from international and non-governmental organizations aid funds

Where $d_1, d_2, d_3, d_4,$ and d_5 are the respective regression coefficients.

The model is based on the pretext/assumption that it could also be argued that SSS, TDV, and AET are possible significant factors to measure SRL. The contribution that these independent

³⁹ Weick 83

⁴⁰ Birch, David.

variables make was not fully researched and argued for the purposes of this paper, but they are recognized as possible salient descriptors of SRL. The primary investigation focussed on SRL dependence on SEB.

Conclusion

The research indicates that ARC as KPD are a rich source of knowledge and by mindfully *prospecting* this knowledge through sense-making, could lead to SRL. This will be dependent on *pecuniary dynamics* which entails a steady flow of *cyber cash/money* into these livelihoods, providing the means to the village people to enhance their quality of life by exercising their own choices (empowerment) on how to spend this money. The pecuniary dynamic is made possible through e-Business models based on *emerging*, sometimes *destructing*, but mostly *adaptive*, mobile and associated technologies. Furthermore, the ARC described as KPD, provides a fertile environment where existing banking and telecommunications companies, through technology applications, communities of users, and new business models converge. This emerging pattern of community enrichment could lead to the upliftment of rural livelihoods which in turn could diminish the phenomena of *depeasantisation* and *de-agrarianisation*. Another spin-off from these new ways of doing business, based on the KPD of ARC, is that it provides a new insight that can be exploited on existing business models and proprietary technologies, developed for rural areas and the developed world. Finally a conceptual theoretical model induced from the literature research is proposed. The model, in the format of a multiple regression factor equation, describing the KPD of ARC, is proposed for further empirical research.

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The Innovators in the New Media Landscape: User Trends and Challenges in the Broadband Society

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Abstract

Broadband distribution and digital multimedia content devices transform the user into a content creator, blurring the border between creators and consumers, between audience and actors. This paper suggests however, that it is in particular young, heavy users of Internet that use the web to create and share content. The lack of non-professional users in general indicates a need for web-applications targeting several user groups. However, demand for the knowledge is great and to a large extent unmet at present. This paper describe state-of-the-art on users as active participants or innovators in the new broadband society and what typical trends and challenges that characterize this new media landscape, this by investigating recent reports on user behaviour and theories trying to describe the new social dynamics in the broadband society. This literature investigation aim is to provide new knowledge on user behaviour and a basis to understand the new emergent media landscape and a starting point for identifying changes in patterns of media use and user needs that is significant for the broadband society.

Introduction

The use of information and communication technologies is now thoroughly ingrained in several parts of the western society, but the complexity of their role is constantly changing and deepening. New media and the Internet is expected to change how people communicate, how they work, and how they leisure, it may also involve new forms of communities and participation. Evidences suggests that we live in a media world where these technologies are integrated into the routines and practice of everyday life (Haddon, 2003; Silverstone & Haddon,1996). The Internet is used at work, in schools, in universities, and hospitals. It is used for a wide variety of purposes and interests, such as surfing for information, playing online games, and chatting (Quan-Haase et al., 2002). Thus, the most profound and latest change in the broadband society is how the users are taking a more active role in the media chain. The users, and in particular younger, are to a greater extent using new interactive media technologies and combinations of new media technologies, from mobile phones, computers and wireless technology in new creative ways (Heim and Brandtzæg, 2007).

This paper investigate the state-of-the-art on user as content-producers, active participants or innovators in the new broadband society and what typical trends characterize this new media landscape. User as innovators is in this paper understood as users that are using new media in new and productive ways. The paper gives an insight on how and which users that is identified as active producers or innovators in the new media landscape of today. In more detail it will also describe how the new media landscape is changing and the new challenges this arise:

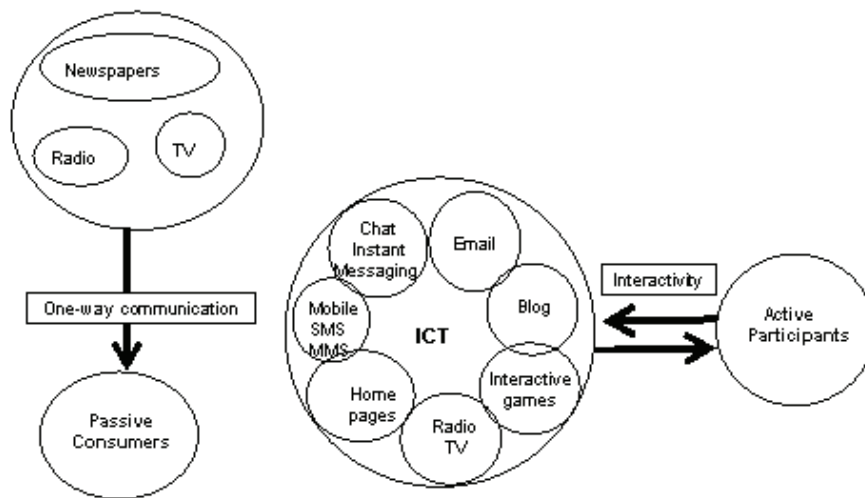
- From user being passive consumers to users becoming active participants and content producers
- From user consuming mainstream professional content to consuming non-professional content.
- From text heavy applications to rich, audio/visual media (multimedia).
- From single use design to community design
- From local to more global online services.
- From a traditional one-to-many model (mass media) to a many-to-some model (The Long tail theory).
- From digital divide to a digital production divide

This literature investigation will try to provide new knowledge on actual user behaviour and a basis to understand the new emergent media landscape. This will hopefully serve as a basis for identifying changes in patterns of media use and user needs, and which current challenges that is significant for the broadband society.

From Consumer to Producer

In the EU (2005) position paper on future competitiveness in ICT it is stated that “people [will] interact with their surroundings and with each other in totally new ways.” NEM and the Strategic Research Agenda (2006 pp. 19), put it this way: “Enabling individual and consumers to create personal applications is seen to be of extreme importance for the future landscape”. Nowhere is this more clearly illustrated than in evolving new social dynamics based on the eagerness of media users to be producers of media content and to engage in networks with multiple users. This trend is seen both within Internet and broadcasting where an increasing number of users produce and share content and engage in different types of social participation and community formation. This implies a shift away from mainstream markets with centralized content provision, towards individuality and fragmentation by citizens taking an active role in the media chain. This, triggered by the widespread availability of digital recording devices as well as display and rendering devices, end-users will be both the largest content producer and -consumer of the future. In general, there seems to have been a shift from passive media consumption of mainstream media content, towards active media participation, content creation and sharing, as illustrated in Figure 1.

Figure 1. Digital society: From passive consumers towards active participation and content production (Brandtzæg et al., 2005).



This trend is also driven by increasing Internet and broadband penetration in Europe and the whole world. According to IST (2006), the take-up of broadband Internet access has risen fast, with growth rates of around 70 percent in EU. Rapid technological advances in UK for example the household usage and adoption of communications services continues to accelerate. According to the OFCOM Communications Market Report (2006) the number of households with broadband connections increased by 60 percent between 2004 and 2005, to a total of 9 million and the number of households with digital television also increased by 18 percent between March 2005 and March 2006, to a total of 18.3 million.

The OFCOM (2006) report reveals evidence that a new “networked generation”, mainly among the younger population, is turning away from old media such as television, radio and newspapers in favour of online services, including downloadable content – used on multiple devices such as iPods and mobile phones – and participation in online communities. Old media consumption, such as television is of declining importance to many 16-24 year olds; on average they watch television for one hour less per day compared to the average television viewer. Instead, the Internet plays an increasing central role in daily life; more than 70 percent of 16-24 year old Internet users use social networking websites (compared those 41 percent of all UK Internet users) and 37 percent of 18-24 year olds have contributed to a blog or website message board (compared to 14 percent of all UK Internet users). Similar findings are done in the survey UK Kids Go Online from 2004, but only among the youngster between 9-19 years that uses Internet on a daily basis. Daily users of the Internet are more likely, compared to weekly users, to use Internet for making web pages, for political participation, for exam revision and for interactive engagement. They also meet online friends and reveal personal information online to a larger extent than less frequent users (Livingstone & Bober, 2003).

It is in particular social networking and community web sites that have changed the way people use new media, in creating personal profiles, sharing photos, videos, blogs and user generated content in general. The two most popular social networking web sites that took off seriously in 2006, is MySpace.com and YouTube.com. MySpace with a music profile targeting the young crowd, have more than 100 million member’s world wide. YouTube, with opportunities for uploading and video sharing has also been increasingly popular entertainment site during 2006. According to Nielsen//Netrating (2006) in October YouTube has over 20 million unique users every day, uploading 70 000 movies every day. The percent

growth of YouTube was incredible 297 percent monthly in the period between January 2006 and June 2006 (Nielsen Netrating, 2006). Both YouTube and MySpace are among the top ten web sites in popularity among users world wide according to measures done by Alexa Web Information Service in December 7th 2006. MySpace are ranked as number five, and YouTube as number seven (Alexa, 2006).

Another report from Nielsen//NetRatings (October 11, 2006) have similar findings, and explains that over a three-year period, the top sites among teens 12-17 have shifted from those offering a selection of instant messaging buddy icons to those providing assistance with social networking profiles and content creation. In September 2003, the number 1 site among teens was Originalicons.com. In September 2006, sites offering tools to improve social networking profiles with song lyrics, pictures, quotes and layout designs won out with those ages between 12-17 years. PLYrics.com is ranked as number 1 among teens, who made up 68.4 percent of its unique audience. According to the report, nine out of the top 10 teen sites either offered content or tools for social networking site profiles, or were social networking sites themselves. The report shows that a wide array of social supporting websites has developed in conjunction with bigger, more well-known web destination such as MySpace and YouTube.

Similar findings are suggested by the research team at Universal McCann (Nathan et al., 2006) in a recently published study "The New 'Digital Divide', How the New Generation of Digital Consumers are Transforming Mass Communication." They present how young consumers are increasingly relying on Web2.0 platforms for entertainment, news, social interactions, shopping, and other daily activities. Note that this study is not representative for the age group presented below. The research conducted is only among people in the 16-49 age group who are frequent users of the Internet (accessed Internet 11+ times in past 7 days)

- The age group 16-34 (frequent users of the Internet) is 25 percent more likely than ages 35-49 (frequent users of the Internet) to use instant messenger, with over 75 percent of ages 16-34 currently using at least one service.
- About 40 percent aged between 16-34 years (frequent users of the Internet) belong to a social network site; this is twice the percentage of 35-49 year olds (frequent users of the Internet).
- Among the top Internet services used is the social networking site Myspace.com with 43 percent of 16-34's (frequent users of the Internet) being current users. In comparison, only 16 percent of people aged 35-49's that are using MySpace.

Other findings include:

- 71 percent of the 16-34 year olds have participated in a blogging activity.
- The 16-34's are three times more likely (25%) than those 35-49 to manage and/or write their own blog.
- While personal and family/friend are the most common types of blogs among the younger group of frequent users of Internet, more than 40 percent are developing photo and pop culture (music/film) blogs as well.
- One third of frequent users of Internet between the ages of 16-34's have participated in peer-to-peer file sharing compared to just 12 percent of those 35-49.

The report suggests a major shift from the world of passive receptivity users to active engaged users, if we look at the frequent users of the Internet, which represent 31 % of the total U.S population. Thus, social networking is clearly popular mostly among the younger heavy users

segments. The report suggests however that a considerable part of the heavy Internet users are interested in creating, sharing and consuming user generated content.

From Single Producing to Peer Production

This new fast growing trend of Internet communities is hard to explain, but Jeff Jarvis (2006) try to explain this in his blog Buzzmachine, “Who wants to own content?” Distribution is not king. Content is not king. Conversation is the kingdom, does he state. He does like several others (e.g. Tapscott, 1999; Tapscott et al., 2000; Tapscott & Williams, in press; Nathan et al., 2006) describe the importance of interaction and co-creation in the new media landscape. This is also pin pointed in an article by Brandtzæg et al (2003 pp 61) about enjoyment in new media: “The sharing of experiences, feelings and information is considered to be rewarding, pleasant and enjoyable”. Studies show that young people are likely to use the computer for playing games together, rather than playing in isolation (Wartella et al., 2000). These findings may be explained by the social facilitation effect (Brandtzæg, et al., 2003); it is easier, and more rewarding and motivating to do things in the presence of others, because mere presence of others is arousing (Zajonc, 1965). Children play more enthusiastically if a playmate is near by, even if only engaged in parallel play. According to Brandtzæg et al (2003) this may, in addition to social facilitation, also be explained by the theory of social cohesion and social identity, a social expression of being part of or attracted to a community. It seems to be that a socially rewarding environment is necessary and essential for all humans, also when it comes to media activities.

These social dynamics of co-creation in new media is described by Jeff Jarvis (2006) in the following way: “you don’t want to own the content or the pipe that delivers it. You want to participate in what people want to do on their own. You don’t want to extract value. You want to add value. You don’t want to build walls or fences or gardens to keep people from doing what they want to do without you. You want to enable them to do it. You want to join in”.

A similar view is proposed by Don Tapscott and Williams (2007) in their upcoming book *Wikinomics – How Mass Collaboration Changes Everything*. The term “Wikinomics” refer to the new economic and new culture related to the wiki – a type of website that allows the users themselves to easily add, remove, and otherwise to edit and change content. This ease of interaction and operation makes a wiki an effective tool for collaborative authoring. Tapscott and Williams suggest that we are entering a new age where people participate in the economy like never before. This new participation has reached a tipping point where new forms of mass collaboration are changing the way services are invented, produces and distributed on a global basis. This participation is driven by the opportunity people have today to link up in loose networks of peers to produce goods and services. The growing accessibility to ICT puts the tools required for collaboration and creation among users. The name of this new mode of innovation and creation is peer production or peering, when masses of people drive the innovation and production, this because people can contribute to the “digital commons” at very little cost by themselves, which make collective action much more attractive. Tapscott and Williams call this structural opportunity for collaboration the “weapons of mass collaboration”: New low-cost collaborative infrastructures – from free Internet telephony to open-source software to global outsourcing platforms.

These aspects of co-creation or the “kingdom of conversation”, may be some of the explanation on why the millions of people from all over the world have engaged themselves in these social media creation activities (e.g Wikipedia, MySpace, YouTube, Second Life) that were previously reserved to elite of professional content producers. Some valuable

products have already come out of this collective knowledge. Generalized broadband access, increased mobility, availability of richer media formats and contents, as well as new home networks and communications platforms will probably drive this development further.

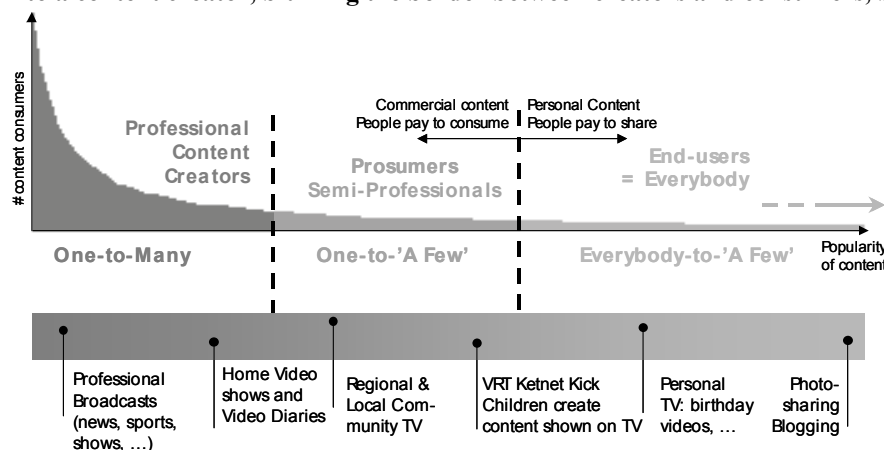
From “one-to-many” to “many-to-some” - The Long Tail

Another theory that also is a relevant explanation of the new social dynamics on the web is “The Long Tail”. The theory of The Long Tail was first developed by Chris Anderson in an October 2004 Wired magazine article, and later elaborated in his book “The Long Tail: Why the Future of Business is Selling Less of More” (Anderson, 2006). The theory explains how mass adoption of new technologies like the Internet is changing our culture and economy. The major change is that the culture and economy are increasingly shifting away from a focus on a relatively small number of mainstream products and markets at the head of the demand curve and toward a huge number of niches in the tail, targeting several and smaller marketing segments. The long tail is primarily an economical model that explains how consumption and customer behaviour is moving from a one-to-many mass media model (a lot of people watching the same content provided by broadcasters or listening to the top seller record), to a many-to-some model (people sharing personal content with their friends and relatives or buying specialized or hard-to-find books) as shown in Figure 2.

Anderson (2006) describes 3 ascendant forces that are creating The Long Tail phenomena:

The first is *democratizing the tools of production*. Many homes are equipped with computers that enable the production of photos, videos, print or text virtually possible to everyone. The second is *democratizing the tools of distribution*. The personal computer made the people become producers, while the internet made people become distributors. The cost of distribution, especially on media products, radically decreased due to the web. The third force is the *connection of supply and demand*. The users demand has to be connected to the supply and can be called the Long Tail filters. That can be for example recommendation engines due to your profile or search engines on the website.

FIGURE 2. The Long Tail - Broadband distribution and multimedia content devices transform the user into a content creator, blurring the border between creators and consumers, between audience and actors



A classic long tail example is how we listen to music in 2006 compared to how we did it in 1960 or longer back. In the era of gramophone people had to make an effort to listen to music. Both the consumption costs and the connection to music in general contributed to a less varied music experience. People picked often their favourite music pieces for listening. When technology allowed users to music listening in several contexts, from radios and cassettes in cars, and walkmans – new and different contexts for consuming music allowed

users to diverge and expand the longer tail of music choice. The introduction of mp3 players such as iPod, made it possible to listen to a random list of songs rather than a whole album and the long tail music repertoire expanded once again. Some of the most successful Internet businesses have leveraged the Long Tail as part of their businesses. Examples include eBay (auctions), Yahoo! and Google (web search), and Amazon (retail) amongst the majors along with smaller Internet companies like Audible (audio books) and Netflix (video rental).

In this new media landscape, users are not only finding their way to more specialized content, but are also turning the consumer into content creators, creating and sharing user-generated media content. Recent years have seen the rise of so-called 'prosumers', or semi-professional users in a one-to-some context. The new content creators however are non-professional users, publishing content in small communities for a limited audience. Blogging, wikipedia, flickr, MySpace and YouTube are typical Internet services and applications that all are examples of this kind of user generated activity. New personal digital productions tools (e.g. camera phones) and broadband distribution combined with multimedia content devices transform the user into a content creator, blurring the border between creators and consumers, between audience and actors.

Another driving force of the Long Tail is also said to be Web 2.0 with more than 14 million citations in Google. But there's still a huge amount of disagreement about just what Web 2.0 means, with some people decrying it as a meaningless marketing buzzword. However: Wikipedia (2006) is explaining the following: "Web 2.0, a phrase coined by O'Reilly Media in 2004, refers to a supposed second generation of Internet-based services - such as social networking sites, wikis, communication tools, and folksonomies - that emphasize online collaboration and sharing among users.

According to Wikipedia (2006) the Web 2.0 shows some basic characteristics. These might include:

- "Network as platform" - delivering (and allowing users to use) applications entirely through a browser.
- Users owning the data on the site and exercising control over that data
- An architecture of participation and democracy that encourages users to add value to the application as they use it.
- A rich, interactive, user-friendly interface based on Ajax or similar frameworks.
- Some social-networking aspects.

According to Bart Decrem (2005) the Internet has resembled a library in some ways and a shopping mall in others over the past ten years. These days, however, the web is becoming more of an events-based place of interaction and participation, because of the Web 2.0. This is in line with what Jeff Jarvis (2006) explains as "conversation is kingdom" and Tapscott and Williams (in press) refer to as "peer production". However, there exists some criticism related to the term "Web 2.0". For example, many of the ideas of Web 2.0 were already featured on networked systems well before the term "Web 2.0" emerged. Amazon.com, for instance, has allowed users to write reviews and consumer guides since its beginning, in a form of self-publishing. Anyway, NEM (2006) report that it is estimated that the biggest impact of Web 2.0 is the improved dynamics and management of service communities.

Thus, new media are beginning to catch up the Long Tail opportunities and the benefits that interaction and user generated content can bring to their offerings in terms of audience engagement and loyalty, but yet the mainstream still has some way to go in understanding the

user and the user needs in the new media landscape (Skrebowski, 2004). It is a question of how to design for co-creation in networked media.

From Single use Design to Community Design

So far web-design have been focusing up on the single user, while the design for co-creation and community still is rather weak. Ann Light (2004a) explains that a traditional media perspective is a one-producer-to-many-recipients model, with a little focus on user participation. By contrast, a range of activities is open to users of networked media. The question, according to Ann Light (2004a), is how these two models of behaviour can be combined to design systems, including trust and commitment to encourage co-creation and co-activity? This question was also given six British online information producers. Some successfully tactics for designing co-creation were reported:

- Display user generated material as an integral part of the website.
- Linking together people with common goals.
- Provide material for users to customize and incorporate into their joint activities.
- Conduct consultation exercises on the web, aimed at groups of users with a view to developing policy.

The focus on the users needs to create content to develop a social identity in networked media is also suggested (Light, 2004a). To give the user a feeling of being part of a group, through social cohesion or social identity is as well recommended by Brandtzæg et al (2003).

NEM (2006) or Networked Electronic Media do also stress the importance of communities and social interaction in networked media. NEM state in their Strategic Research Agenda the following topics to be addressed for facilitating communication in communities :

- Management of communities (social networks). Several different communities exist; a group management mechanism should therefore keep knowledge of all group characteristics.
- Providing group awareness via group context. Context awareness can facilitate the social interactions and decision making processes in communities.
- Privacy of personal information in communities: The privacy of personal data is a fundamental user requirement. Mechanisms must be deployed that enable users to decide what private information is revealed.

A conclusion is that future co-created networked applications should aim to focus on the social aspects and relationships among users, because co-creation is dependent up on involvement, trust and identification. The users are not just happy with their opportunities to create meaning and content in networked applications, they do also want to create identity. This could be either a kind of personal virtual identity, but also an identity to a specific community or a social identity. According to Ann Light (2004b) the users request for group identity in a fragmenting world and in a fragmenting media landscape, a focus on social identity to in online communities may therefore be a key to make successful networked applications for the future.

From Text to Rich Media

The NEM-initiative addresses all aspects of the media life cycle, and is focusing on the shift from professional content creation to increasingly involve individual citizens. This is in line with the “The Long Tail” theory (Anderson, 2006), Wikinomics (Tapscott & Williamsen, in

press) and the perspective of Bart Decrem (2005) of Web.2.0 as participation platform on the Internet.

However, according to NEM, a key goal will be to support end-users with content creation process and personal content management in rich media. The winners in the market of new media will deploy rich media online experiences – interfaces that seamlessly integrate images, video and audio to create an immersive user experience. To day, most users cannot create, manage and share multimedia digital content as easily as they can manipulate text, for example in chat rooms, email and word. This challenge is also formulated by Visser and Visser (2006); they state that one of the main goals of HCI (Human-Computer Interaction) in the next few years will be to make systems “easy to develop” and empowering non-professional users to develop and adapt systems themselves. Users are becoming active co-creators of their media, commerce, entertainment, and communication experiences.

The first and second generation of websites have focused on making the services usable. With the new possibilities of rich media over high speed connections, a new era of usefulness, conveying a whole new dimension of information. The bulk of user generated applications of today are mainly allowing users to publish and share lean bandwidth content – typically text and pictures. The current frontier of user generated applications is the development and market introduction of applications that allow rich user generated media content. Rich Media is defined as: - images, streaming video, voice audio, music, 3D and animation. Also content will be made accessible to a broader range of user terminals and interfaces, including mobile devices.

In this new multimedia media landscape there is also a trend towards letting end users edit and share content from newspapers, encyclopaedias, public archives, and broadcasting stations. Both video and audio content are increasingly more accessible for novice consumer group. According to Shafer (2006) creative Commons licenses, and general licensing deals will make content easier to find, and audiences will have more freedom to reinterpret content. For example, in the UK, BBC has licensed 1,000 hours of content to its audience to allow it to rip, reconfigure and share it, in the expectation that user creativity will produce novel services or programmes. In other European countries and the USA similar initiatives are underway, typically seeking to identify the advances in audio-visual systems and applications that will lead to a broad take up in the market. The same trend is visible with basic web applications such as flickr and jusspress where the user originates content and the network application compiles or collates it.

Existing user generated applications started as relatively simple tools with fairly high immediate usability and learnability, making it easy for the users to get started using the applications. Subsequent development of additional tools and features as well as multimedia dimension within the framework of existing user generated applications – as e.g. that represented by the Norwegian network community underskog.no – has lead to the once simple user interfaces has become more complex and less intuitive. It is a key challenge for the businesses in this market to be able to keep these applications usable and also to introduce more complex features and media as video and audio in an ongoing development.

The number of file formats has increased dramatically, after the web in generally has moved from text to multimedia. Browsers acquire the ability to display media in various formats through the use of plug-ins. Underskog.no for example will not allow the user to have a satisfying experience with the browser Internet Explorer, but ask the user to rather shift to the browser Firefox. Adding multimedia to a web application is more difficult than creating a simple page of text (Heller & Martin, 1999). Multimedia creation tools are sophisticated from

the average users point of view. Flash movies and Dreamweaver offer ease of use for professionals but not for the average citizen.

Therefore, there is a need to provide more intuitive end-user applications for these new forms of multimedia collaborative content creation. To that aim it is also a key to identify which successful multimedia applications and features users want to use, and inspire citizens to communicate, share and produce content and thus extending the applications for multimedia content.

These challenges raise the important questions:

- What kind of multimedia content do users want to produce and share – and in what way?
- Whom do they want to share multimedia content with?
- Where and when, in what context, do they want to produce and share multimedia content?

In terms of the complexity and convergence among end-user technology products and applications an important aim will be to generate knowledge to enable the user in keeping pace with their new multimedia applications and features. For future applications targeting user generated multimedia content this requires a significant focus, not just on ease of use, but also more knowledge on who the European user of such applications is, and what are the future users of these applications as well as their user needs.

From Local to Global services

Internet is starting to get entry into every corner of the globe, and products and services that were one local have become global (Bojko et al 2005). Now that more and more applications are used globally, international cultural differences can become apparent. As Tapscott and Williams (in press pp 10) points it: "In the past, collaboration was mostly small scale. I was something that took place among relatives, friends, and associates in households, communities, and workplaces." Now this is changing in to be a mass collaboration in global networks.

However, patterns of users' behaviour and needs will still appear and it's important to take into account possible cultural differences when designing user experiences. There aren't that many products or interactive systems that are really used by "everybody". Targeting "everybody" with an interactive system is not easy, nor cheap. User requirement analysis can contribute to defining precise target audiences that are more likely to use it. However, large-scale, multi-user communities such as MySpace and YouTube are both services that are going beyond national communities and operate on global basis. According to Bojok et al (2005) an obvious requirement is to have usability testing with local practitioners, to ensure that local user needs will be taken in to account. User studies and requirements studies in the different countries where target groups for the application lives would also be useful. Thus, to day there exist only a limited number of cross-cultural comparisons of the experiences of ICT uses (Livingstone and Bovill, 2001). There is a need for both country specific and more cross-cultural research on ICT adoption and use.

From Digital Divide to Digital Production Divide

The escalating importance of Internet and other forms of ICT in work, education and daily life is incontrovertible. The development of a social dynamics and on the Internet do also put a greater demand up on the user to be active and productive (Brandtzæg et al, 2005) in new

media by contributing in new online communities with their own user generated content. This may indicate a new notion of the digital divide, a divide between those who consume and those who produce or a “digital production divide”. Tapscott and Williams (in press) claims that only the connected will survive in this new world. And citizens who fail to grasp the collaborative opportunities will be isolated from the networks for sharing, adapting, and updating knowledge are the new value. A similar view is suggested in the report “The New Digital Divide – How The New Generation of Digital Consumers are Transforming Mass Communication” by Nathan et al (2006).

The digital divide has traditionally been conceptualised as the split between the “haves” and “have nots” of new media. However as the usage and technology development has been changing the debate around the digital divide has progressed. A central focus of most recent research on the digital divide has been a question of “digital literacy” rather than of access (O'Connor & al., 2004), centred on “quality of use” (Livingstone & Bober, 2003). According to OFCOM (the independent regulatory body for the UK communications industry), digital literacy is the ability to “access, understand and create” communication in a variety of contexts (Buckingham & Others, 2005; Livingstone, Van Couvering, & Thumim, 2005). The level and development of these skills are believed to have major implications for the individual, the education system and society in general.

According to Jacob Nielsen’s (2006) Alertbox for the 9th of October 2006, the majority of users don’t participate very much in communities and online social networks that rely on user generated content, but rather lurk in the background. There is a participation divide. According to Nielsen user participation often more or less follows a 90-9-1 rule: There are in online communities 90 percent lurkers who never contribute but read or observe. 9 percent of users contribute a little, but other priorities dominate their time. 1 percent of users account for almost all the content production. This means a tiny minority of users’ accounts for most content and the system activity in general. One example is Wikipedia, where more than 99 percent of users don’t contribute, but consume. Wikipedia has 68,000 active contributors, which is 0.2 percent of the 32 million unique visitors it has in the U.S. alone. The same number we will find on the YouTube, that almost have 20 million users, but only 70 000 contributors that upload their own videos. Another example from Nilsen (2006) is that among the 1.1 billion Internet users, only 55 million users (5%) have weblogs, and that only 0.1 percent of users post daily.

This type of participation inequality or divide was first studied in depth by Hill et al (1992). Nielsen (1996) does also refer to another study of more than 2 million messages on Usenet (Whittaker et al, 1998). They found that 27 percent of the posting activities were from people who posted only a single message. 3 percent of the posters contributed for 25 percent of the messages. Nielsen (2006) suggests therefore that the big-picture statistics of online communities often give a biased understanding of the level of participation. A lot of the statistics do not take in to account the differentiated level of participation and the many differences that exist between users who are active creators and post a lot and those who are inactive and post a little. The problem is, as Nielsen concludes, that we will never hear from the silent majority of lurkers in these online communities. But, as Nielsen point out, participation inequality is not necessarily unfair. If some users don’t want to contribute, they are allowed to do so. The problem is that the overall community is not representative for the majority of the users. On the other hand the problem could be more serious if it is like Tapscott and Williams (in press) suggests that citizens who not make use of the collaborative opportunities will be isolated in the new economy. The challenge for the future online

community is therefore to re-shape the 90-9-1 distribution to achieve a more equitable distribution.

It should therefore be made more easy for the average user to generate their own content.

But, who are this 1 percent contributing in online communities? As shown in the previous text these are people are mainly early adopters and teens. The report from Nielsen//NetRatings (October 11, 2006) showed how web sites with social networking profiles and content is the number 1 site among teens. But, even among teens there are differences in use. The big-picture statistics might persuade that the digital divide is bridged. According to the report done by Nathan et al (2006) just 14 % of the heavy Internet users maintain their own blog. These figures are small if you actually look at the percentages that actually use technologies. The fact is that there is just a small proportion of the general population that use ICT for active content creation and participation. Similar findings are also to be found in other studies on media use among children and young people (Livingstone & Bovill, 2001; Heim et al, 2007; Brandtzæg et al., 2005; Heim & Brandtzæg, 2007). Nathan et al (2006) suggest anyway that a small number of active Internet users not is insignificant, and that these consumers are quite influential. Additionally, the report concludes that this number of user innovators is on the rise, and that content creation will become the norm.

However, these figures may suggest a new face of the digital divide related to the new social dynamics in new media in combination with a rich media landscape might appear. Higher involvement in terms of co-creation and content production will be difficult to master for certain citizens, with no or low digital media experience. A new digital divide may come into view, between those that only consume media, and those which also produce. This divide might be described in the following terms:

1. **Digital Consumer Divide**, inequality in access and user skills to every potential consumer of new media.
2. **Digital Production Divide**, inequality in access and user skills among every potential producers or co-creator in new media.

Conclusion

This paper investigates the literature that describes the new popularity of co-creation or content production among users and the social dynamics in the new media landscape. The paper gives an overview over recent reports to describe who the users as innovators is, as well as new trends that characterise the new media landscape and the new challenges that will arise to design new applications targeting all user groups.

So far, the new media landscape in terms of rich media and user generated content, put a greater demand up on the non-professional user, since the users needs to turn from being passive to being active or from a passive consumer of content towards an active role in the media chain. In conclusion, ICT participation differs too much among users, and the Internet connection and broadband connections are also still too low in several countries in Europe. Therefore, a new digital divide may come into view, between those who have inequality in access and user skills to be a potential consumer of new media, and those who have inequality in access and user skills to be a producers or co-creator in new media. This is also exemplified in the 90-9-1 rule described by Jacob Nielsen (2006), suggesting that just 1 percent actually contribute actively in online communities. In short, the new media landscape is turning more complex in regard to digital literacy.

In more detail the new media landscape is changing, and it changing fast:

- From consumer to producer
- From text to rich media
- From local to global services
- From one to many, to many to many
- From single usage to community usage

The investigation in the literature may provide substantial new knowledge on actual user behaviour and a basis for the development of user and context requirements for collaborative networked media experiences in the broadband society.

This review may provide a basis for identifying changes in patterns of media usage and user needs. There was still a lack in the present literature on relevant user studies addressing real user needs for the co-created future networked applications, such as A/V – community2.0 applications.. Several reports suggested however that the innovators of user generated content applications so far, mainly are younger users and heavily users of the Internet or so-called early adaptors/lead users.

Finally, a result from the literature investigation was that future co-created networked applications should aim to focus on the social aspects and relationships among users, because co-creation is dependent up on involvement, trust and identification. A solid focus on the interactions among users and their opportunities for building social identity in online communities may therefore be a key to make successful and digital inclusive networked applications for the future.

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Inside The Circle: Using Broadcast Sms In A Sports Club

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Abstract

With over 100% penetration, the mobile phone has become a normalised part of everyday communications in Ireland. This paper examines the use of the mobile phone within two Irish sporting clubs and finds that in both the regular practice of communication has been transformed by the use of broadcast SMS text messages sent using the 'distribution list' facility on handsets or through the web. The SMS are sent by club administrators for information distribution and as reminders for gatherings, causing an increased cohesiveness within the group.

For the administrators, broadcast SMS offers a convenience in what is a voluntary job, communicating information on fixtures, matches and training, essential for the smooth running of the club. For the club members who receive the SMS, the distribution of such information through their mobile phone has saved time and minimised travel, while strengthening their ties to the club. Both groups are enthusiastic and quote instances of how it provides new opportunities to them and how they can plan their lives around this new way of working.

Introduction and Background

The growth of mobile phones in Europe has been well documented (Dunnewijk & Hulten, 2006), and Ireland is no exception. Although the fixed line telephone was never as ubiquitous as in other European countries (Flynn & Preston, 1999), when the mobile phone became widely used for social interaction in the late 1990s, the Irish population were quick to adopt. Penetration has now reached 111%, (March 2007 figures) (ComReg, 2007). Irish mobile phone users are also avid users of the SMS service, sending on average 117 text messages per subscription per month. This reflects the "maturity of the Irish SMS market and popularity of SMS amongst young people" (Gilligan & Heinzmann, 2004:9).

Once with an economy firmly based in agriculture, Ireland owes its recent economic success to the information industry, and has a consequent growth in urban development, particularly along the east coast around the capital, Dublin. However, much of the rest of the country still reflects a widely distributed population, in particular the west (the location of this study) where 58% of the population live in small villages or open countryside linked by a few main routeways and many small roads, and with a poor public transport infrastructure. (CSO, 2003) ¹ For this population, the necessity for a mobile phone takes on different meanings to those which have been described in many of the urban-based studies of young people .

The sports clubs explored in this paper comprise geographically located communities, people who live within perhaps 10 kilometres of each other, and who regularly meet to follow their common interest in the traditional Irish sports of hurling and Gaelic football. The members of these groups were meeting and communicating long before the mobile phone was available,

¹ In the West, only 41.8% of the population live in towns of 1,500 people or more. The population density in this area is approximately 32 per km².

and so the technology per se is not enabling them to come together (as might be considered with Internet communities), but rather providing a new tool to enhance their repertoire of correspondence. The clubs have integrated the use of the mobile into their everyday patterns of communication in order to keep members informed and minimise the work and travel involved in bringing people together.

In many western countries, studies have described the decline of local communities and the consequent loss of social capital (Putnam, 2000), and this has been mirrored by Irish research (NESF, 2003)². However, much as Irish people may not be linking to their neighbours or volunteering for local ventures in the numbers they once did, evidence shows that sports activities are still well supported (Delaney&Fahey, 2005), and that both active and passive participation is high. This is particularly true for the traditional Irish sports, which are administered by the Gaelic Athletic Association (GAA) and are strong at a local level throughout the country.

The GAA is the largest sports body in Ireland, with more than 2,500 clubs on the island. These are run as voluntary, community-based initiatives which usually draw their membership from the local district, and are particularly strong in rural areas. The emphasis on community is stated in the aims of the organisation:

“The GAA club should ... [be] one that provides leisure and social activities for all ages and genders in its community. The Association and its clubs should also become involved in non-team based activities, by supporting local developments, promoting cultural activities, ... supporting schools and contributing to community infrastructure.” (GAA, 2002)

There are two main games played, hurling and Gaelic football, and competitions are organised between clubs in each of the 32 counties, with progression to a country-wide competition. Each county also fields a team, with members drawn from the clubs within it. The level of interest in inter-county competitions is very high and provides a talking point for the whole country at competition peak times. The sports are also encouraged through a number of active schools competitions, and most clubs field a number of children’s teams. Considering that this is a non-professional game, the levels of commitment put in by players often matches those of their semi-pro peers in other sports. The organisation is centrally administered by a paid staff in the Dublin headquarters, located in a state-of-the art stadium, but clubs retain autonomy over their activities, and all club work is voluntary.

The game plan: Research outline

This research is based on interviews with 22 club members and supporters, exploring their use of the mobile phone for social and organisational interaction. It is backed by a survey (n = 40) gathered at local games. Players, supporters and management from two clubs participated – a hurling club (male players) located in a rural area in the West of Ireland, and a ladies’ football club in Galway city, the largest conurbation (72,500 people) on the Atlantic seaboard (CSO, 2007). The research objective is to examine how mobile phone use is altering

² The Irish government have consulted with Putnam and actively speak about the importance of ‘social capital’ which could be lost by the increase of individualisation and commoditisation. They have set up a number of task forces to promote civic participation throughout the country. See <http://www.activecitizen.ie/>.

personal communication patterns among those with existing close ties. Focusing this within the GAA clubs gives access to community groups who exist within a local geographic area, and whose main communication lines have historically been with face-to-face communication. It might be assumed that the mobile phone would offer new opportunities to extend and develop these existing relationships.

During the main playing season, April through to September, teams play at least once per week, and clubs need to have regular communications with their players on activities such as fixtures, training and results. Since the nature of the sport is that people are away from their home base while participating, mobile phones are the main form of communication being used for social interaction by all concerned. They are used in a number of scenarios within the club: by administrators for their management and for intra-club communication, and by the players and supporters to stay in touch with both the club and each other. Mobile phone ownership is a given for this cohort - all of the interviewees have their own phones, and when asked they could not name anyone of their friends or acquaintances who did not carry one.

Creating our own match strategy: Club administration

Each GAA club has a formal committee who are responsible for the day-to-day running of the club and its premises (clubroom, social centre and pitches). Communication on match arrangements (fixtures and training) would originally have been done by face-to-face contacts – calling at houses, passing messages through others, or having an announcement made in the local church. In more recent years, the fixed line telephone may have reduced the amount of work this engendered, but burdened the secretary with many calls in order to ensure everyone was informed. This work has largely been replaced by the use of broadcast SMS messages sent to mobile phones.

The ability to broadcast SMS messages is the “killer application” for both GAA clubs. Sending an SMS message to a group of people can be done either through web-to-phone access, or using the ‘Distribution List’ facility found within the software of (some) handsets. All of the Irish mobile phone service providers offer a limited number of free texts per month (up to 300) and the facility through their websites to send texts, in a single transaction, to all members of a pre-specified group.

For the clubs, broadcast SMS enables contacting a pre-specified group of members with a single message, a facility that is not available on land-line telephones, and provides a speedy option for distributing information on matches and training. It also ensures that everyone gets the same information, and because of its asynchronous aspect, the receiver doesn’t have to be present to accept a call. The club administration staff use broadcast SMS messages for a variety of reasons – organising meetings, reminders for training, and providing information on game fixtures.

One of the duties of the club secretary is to convene meetings, which usually take place on a monthly basis. To ensure maximum attendance, the secretaries of both clubs have taken it upon themselves to send reminders to the committee of the upcoming meeting. The secretary of the ladies club explains:

“You would always have been able to contact people, so text replaced phone calls. ... Now it’s just handier to make a distribution list and the one text and send it to everybody.” (female, club secretary, aged 35-45)

Each adult team within the clubs has its own manager, and these managers also use broadcast SMS to remind their players of upcoming training and matches. This would originally have been done by announcing details of the next meeting to all gathered in the dressing room after a game or training session, and in that busy space, players frequently did not register what was being said. Getting an SMS message means not only do they receive the message, but they also don't have to recall all details as these are stored in the phone's 'inbox'; in effect they carry the reminder with them wherever they go. As one player remarked:

"It's easier to have a message on your phone, whereas, if you get it by post, you'll just leave it on the [kitchen] counter and forget about it."
(male, player, aged 25-35)

Using broadcast SMS not only ensures the members won't forget a meeting; it also gives flexibility to the organisers around arrangements. In the past, changes such as training at a different location, or new timing for a match would have meant trying to contact a large number of people in a short time, and calling off a session in the case of, say, poor weather, was not undertaken lightly. This new flexibility means that everyone can be informed of any changes directly and quickly

The managers and committee members are all very enthusiastic about the new affordance provided by broadcast SMS. Talking about her use of the technology, one manager says:

"I do that a few times a week. I find it very, very good. To do it by land line you'd have to hang up the phone, and lift it again, and dial every number ... [and] ...engage in conversation, and sometimes the person wouldn't be there, and you'd have to go back and try that number again later. At least with a text message it's gone. And whether they read it there and then, or read it the next day, it will deliver eventually... It is fantastic." (female, manager, aged 45-55)

The club members who receive the SMS are passive in this transaction – they only reply if they can't make the session. However, they too are very positive about its use. They appreciate the timeliness and speed of the information they receive, with one member describing how previously a decision on fixtures taken by a county committee on Monday evening might then have been communicated by post. This entailed the secretary writing postcards on Tuesday, and players waiting until these arrived before having confirmed arrangements:

"... at one time you wouldn't know until Thursday or Friday. Now, with the phone you know Tuesday morning." (male, player, aged 25-35)

Getting speedy updates on changes to venues or cancellation of a match due to weather conditions also eliminates unnecessary travel, an important factor especially for rural dwellers.

Interestingly, the one exception to sending group texts in each club was when wanting to send a message to underage players. The managers explained that either because the players didn't have mobiles themselves, or perhaps that the message should go to the parents who would be bringing them to matches or training session, it was often better to use another approach. In

one instance, the players were all attending the same local school, and during term time that was a point of contact where a message could be delivered to the group as a whole. Only in the summer months did the manager need to call, and that was to the home rather than to the individual.

Normally club information SMS messages are sent out to everyone only by the management. However, sometimes texts are also sent as a 'daisy-chain' from player to player, not using a distribution list but rather as a 'pass it on' type message. One player described how he had got a text a few days earlier which had been 'doing the rounds':

"Tomorrow evening now we have the underage [players] receiving medals, and the older members of our club say 'Please show up, because they love to see you coming, they look up to the older lads.' And everybody got a text... I got it two or three times, off different people, so I'll definitely go up tomorrow night." (*male, player, aged 25-35*)

The team effect: Changing attitudes since group text

Club members are an already close social group who all live within the same area, may have gone to school together, are often related, and have a shared background and history. They also meet regularly face-to-face, seeing each other a few times a week to play football or hurling. Overall, the mobile phone communications serve to strengthen these (already strong) ties. Among themselves, members use text messages frequently, often to arrange face-to-face meetings, something which can be difficult for rural dwellers who do not live in easy proximity:

"It's very handy when you can just text all your friends and meet up, like. And I suppose the relationship is stronger, the more we see of each other." (*male, player, aged 25-35*)

A number of members remarked on the bonding effect of increased personal phone communication:

"...[with the mobile] ...you would be closer to the friends you've had for years." (*male, player, aged 25-35*)

When asked about the changing patterns of communication within the club brought about by mobile phone use, all of the interviewees mentioned the broadcast SMS sent by the administrators, usually referring to them as "group texts". They described how being included in the team panel or committee who receive group texts created a sense of integration into club affairs:

"... makes you feel inside the circle, like." (*male, player, aged 18-25*)

This point was more pertinent for younger or newer members than for others whose role was assured due to their long-term team membership or local renown as successful athletes. This feeling of inclusion has been found in other studies of group text systems, such as that of Farnham and Keyani who implemented a group text message system among a number of socially active friends. (Farnham & Keyani, 2006) In their analysis, members reported a strong sense of connection to the group, even for those who did not themselves ever broadcast messages. In a study of the impact of computer networking on community,

Kavanaugh surveyed parents who were sent information through email by a school board, which in effect is the computer equivalent of a group text (Kavanaugh, 1999). In this case, 91% of respondents reported that having school issues communicated to them through the list had made them feel more involved in school issues. Being included in an information ring appears to automatically bind members to a group.

The effects of inclusion generated by the broadcast texts has also had ramifications for the social capital of the group. Social capital has been defined as:

“the degree to which a group ... uses mechanisms such as social networks, trust, reciprocity and shared norms and values to facilitate collaboration and cooperation.” (Ling, 2004a)

It is a topic which has engaged the Irish government in recent years, as they are concerned that Ireland’s new-found wealth has led to a decline in how citizens might contribute to civic engagement and volunteer to support a healthy society. The role of ICTs in social capital formation has been explored in several studies (Pigg & Crank, 2004; Ling et al., 2003; Ling, 2004a; van Bavel et al., 2003; Wellman et al., 2001; Quann-Hasse & Wellman, 2002; Anderson, 2004)

Social capital is commonly considered to take two forms. These can be “bonding”, which suffices to keep a group closely connected, and “bridging”, which forges links across disparate groups (Ling, 2004a). In ways participating in a GAA club can act feed both forms. It bridges society as it is recognised in bringing together people of different politics, professions, and income groups³; and it bonds them in a way that they consider those outside the club (or in other clubs) as a distinct “other”, at least for the day of the match, and in the case of long-term rivals, as a permanent target of difference, as exposed by the colours one wears. By their very membership of the club, and the voluntary nature of their contribution, players and club administrators are engaged in generating social capital. When broadcast SMS is used to remind and encourage others to participate, it is acting to maintain (and strengthen) the existing cohesion of the group as a whole, or bonding social capital. Since the broadcast SMS are sent within the club only, they do not in any way contribute to the bridging aspects of social capital

The group texts also engendered feelings of egalitarianism within the club. Since everyone receives the same message, from the same source, at the same time, no others in the group have extra or ‘insider’ knowledge. As one club player put it:

“It is good because everyone gets the same texts. There is no one better than anybody else, everyone is kept in the same loop, and you can’t say you didn’t get it.” (female, player, aged 25-35).

Similar results have been reported by Weare et al. in their examination of the use of email for inter-group communication in voluntary community organisations. They reported that the

“... broadcast capability of the internet may allow information to be shared throughout a group efficiently, and thus reassure members that

³ “The GAA ... has a wide social class spread in its membership: while 40 per cent of its members are from either the skilled or semi-skilled manual classes, 33 per cent are from the higher or lower professional classes.” (Delaney & Fahey, 2005)

they are on an equal footing where information access is concerned.”
(Weare et al., 2005)

Even the club committee members who sent the SMS were aware that they were creating important feelings of inclusion, and the delicate diplomacy ensuing:

“... people feel left out if they aren't informed of something, whereas if quite a few people are informed, and you are the one who is not, you'd wonder why, ...they expect it.” (male, treasurer, aged 35-45)

Although using a centralised form of distribution, group texts are thus seen to disseminate power (in the form of knowledge) through spreading information.

Although no club members referred to them in this way, one could also consider these texts to be a form of control. The content of texts are directive, and while they remind players of events, they also set an expectation as to their behaviour in attending them. There has been much written on the role of mobile phones as an 'electronic leash' whereby parents keep tabs of their offspring and children 'kickback' to subvert this (Ling & Yttri, 2005). On a more macro level, broadcast SMS in particular has been used as a form of control in political contexts (Linchuan Qui, 2007). In future, club administrators may need to be careful that they do not over-use the broadcast SMS facility otherwise they may be viewed as monitoring rather than reminding members of their obligations. They may also need to be careful of the style in which the text is written. In fact, one player admitted that she sometimes ignored the group texts, which she recognised as being a generic message due to how they were worded:

“I would say that group texts are very impersonal. Say for example I get a text 'We definitely have training this evening at 7 o'clock', people might ignore it, and say 'That's a group text'. Whereas if it was sent directly, 'Hi Sandra, make sure you train this evening', you'd probably pay more heed to it.” (female, player, aged 25-35)

The group text is in this case having the effect of distancing her rather than bringing her close.

While welcoming the club group texts, club members did not have a positive attitude to information texts such as those provided as a paid service (usually referred to as 'text alerts'). Only two were subscribers, both receiving sports information. In fact several respondents quoted negative experiences, either their own or a friend's, where they had signed up for such alerts, but found the service expensive as they received more than they expected, and subsequently had difficulty signing off the service. The positive attitudes towards incoming club texts was due to the fact that they know the incoming club texts are going to be directly relevant to their chosen leisure time activity and help to plan their week. The texts received from the club are also free to receive. However, one might speculate that even these might possibly be unwelcome if they were too frequent or extended beyond what is deemed necessary information.

Lessons from the sideline: Analysis

Broadcast SMS is a feature offered by both handset manufacturers and service providers, so it is not surprising that the club administrators might use it to communicate with their members.

What is perhaps unexpected is that the wholesale adoption of this ‘way of using’ the mobile phone has had a fairly radical change in the overall patterns of club communication and has caused the clubs to shape their work practices around it. Also significant is how its enthusiastic acceptance by club members has had a positive affect on the dynamics of the group as a whole, a fact which makes its presence now a necessary part of club interaction.

There are many instances of users shaping telephone technologies in ways that their designers did not anticipate. In the early 1900s farmers in rural parts of the United States created their own ‘barbed wire’ networks (Fischer, 1992); it was kin-keeping telephone calls made by women which led to the acceptance and eventual dominance of telephones for social use (Moyal, 1995); and more recently the use of texting as a cheap means of staying in touch by teenagers established SMS as a new mode of communication (Ling, 2004b). In each instance, everyday patterns of contact were made easier by users adapting the available technology to suit their own needs. This is what is happening in the sports clubs.

The incorporation of broadcast SMS into club work patterns is an example of user innovation not by technologically skilled or elite users, but by everyday end users. Club members are not even particularly enthusiastic about their mobile phones, and in interview have described its role in their lives as a functional tool, not as a fashion object or technical gadget:

“It’s not that it’s important to me in my life, obviously, like, it’s something that’s very, very handy.” (male, player, aged 18-25)

Haddon describes such creative use as:

“daily acts of ‘innovativeness’, routine ways in which users actively manage their technologies.” (Haddon, 2005)

The use of group texts in both clubs, which are geographically distant and not linked in any way, might suggest that this is a somewhat natural development of use which has evolved independently in both places, rather than being a novelty application which has spread through club connections.

Although a key technology in this case, SMS is generally not considered to be suitable for administration work. In one of the few studies on this topic, Svendsen et al. compare the use of SMS and email in office environments in a Scandinavian town (Svendsen et al., 2006). The authors conclude that SMS as a tool does not align with work practices in the way that email does, citing the fact that most people carry only their personal mobile phone, and prefer to use fixed line phones (paid for by their employer) rather than take on the added cost on their own mobile account. In the GAA clubs, administrators are regular club members who volunteer their time and energy to the club, taking on their post usually for one year. When doing this voluntary work, they do not use a club-provided handset, but in effect also volunteer the use of their own mobile phone, and personally pick up any costs that might accrue through sending the messages. Although they may have purchased their phone for social (recreational) use, they are actually adopting it as a work tool. In interview, no-one mentioned the added cost of keeping in touch with club members, probably because currently broadcast SMS is offered as a cheap feature (multiple sends for a single price, or with free access through the internet).

Using broadcast SMS has limitations as an effective work tool. To use the free group texts facility through a website, the phone owner must first log on using their own account details

to set up a user profile. When they enter the names to be included in the group text, they set up a group which is only accessible through this profile – unique to their account. Thus, if a manager sets up the names of 20 players onto a list entitled, say, ‘senior players’, and then resigns their voluntary post at the end of the year, they cannot easily pass on the details to the next manager - all numbers must be entered again. Similarly, if they use the operating system of their own handset to set up a distribution list, they cannot easily move this to the handset of an incoming manager when they resign. As a work practice, the use of personal mobile phones in this way means that the data is ‘owned’ by the phone user, not by the entity on whose behalf they are doing the work.

The ease of using broadcast SMS and its popularity with recipients would suggest that it will in future become a normalised and expected part of club interaction. For administrators without a computer to hand (or for use ‘in the field’), it is most convenient if they have a facility on their handset to send a group text, and club administrators did state that it was an attribute they would look for when purchasing a new handset. However, not all handsets offer distribution lists as part of their operating systems. Consumer choice will certainly steer club members away from these.

Writings on the use of internet communications to connect communities of place agree that the success of ICTs in maintaining strong social networks is partly due to the fact that individuals can contribute to the community by their on-line activity (Farnham et al., 2004; Norris, 2004; Weare et al., 2005; Wellman et al. 2003) This is the same pattern that is evolving with social networking software and other web 2.0 platforms – participants contribute content to the fora, which strengthens their links to the network and adds to the synergy of the network as a whole. The networked model does not apply to using broadcast SMS in the sports clubs. The direction of communication is simplex - administrators alone send the messages, and the member recipients are inactive (unless to report a problem, and then they interact only with the administrator). Even though every member could send texts to all the others, none choose to do so, making this a centralised, top-down pattern of communication.

Despite not following the flatter, multi-stranded network model, members have reported that they believe the broadcast SMS do strengthen their group. This could be so if we consider that the texts are simply a mechanism for information sharing or coordination which, when effective, brings people together to develop the deeper exchanges which will bind them. In their examination of the potential of ICTs to build social capital, Pigg and Crank distinguish between the use of technologies to deliver *communication* and *information*, the former being expressive and the latter instrumental (Pigg & Crank, 2004). Within the clubs, the initial delivery of instrumental information by broadcast SMS is leading to face-to-face meetings which then build on communication and enhance the richer and deeper personal links which build a basis for the trust and reciprocity of social capital.

Conclusion

The mobile phone is becoming normalised in Irish society, and its use is widespread in the sports clubs included in this study. The club administrators who use broadcast SMS have a very practical attitude to its role in their lives, and yet their ways of using the device have had an important impact on the overall bonding of members to their sports club. Receiving group texts has not only saved members time and travel, but it has also strengthened ties and reinforced feelings of inclusion. This feature may need delicate handling, as over time,

building the SMS into the routine of club matters will create expectations of the level of information available throughout the group, and perhaps an increased dependency on being reminded of events and kept up-to-date with club affairs. On the other hand, if overused, it may make recipients ignore the messages sent. The patterns of communications created here are contrary to the networked pattern and content subscription model evoked by most recent technologies. However, since the sender is doing a voluntary job, and one which may be taken on by any of the recipients in the future, the hierarchical direction of communication is not seen negatively. It is viewed more as providing an aide-mémoire than an order.

The club administrators who send the SMS are by no means lead users; they are simply exploiting a cheap aid to do their voluntary work. And although SMS are not normally considered a work tool, using a distribution list as a simple database in this way markedly eases the burden of communication in the club. In effect, it keeps everyone 'inside the circle'.

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The Challenge Of User- And QoE-Centric Research And Product Development In Today's ICT-Environment

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Abstract

Within today's ICT environment, trends like a growing convergence and increasing competition, have led to a fast-changing market with an increasing speed of innovation development and shortening product life cycles. Because of the skipping of research stadia, the lack of insight in the end-user expectations, needs, experiences, and of suitable methodologies ... the number of failing innovations has increased remarkably. On the other hand, the boom on the supply-side led to an enormous empowerment of the consumer. Influenced by these trends, a clear evolution towards a more user-centric, 'pull'-driven mentality started to manifest itself from the early nineties on. In this respect, the concept of 'Quality of Experience'(QoE) started to acquire a central place in today's innovation and technology development literature, as the success of innovations has become highly dependent on the *experience* of the user. This paper focuses on two major challenges 1) 'What is QoE?': to date, there still exists a lot of inconsistency and confusion about the interpretation and definition of QoE. In order to tackle this challenge a conceptual model of QoE is presented. The second challenge is related to the question 2) 'How should QoE be measured?' In this respect, an overview of the most important problems is given and a new approach for more user-centric QoE-measurement is proposed.

Contextualisation: 'How come it goes so slowly when it goes so fast?'

Within today's ICT-environment, technology provides content creators and consumers with a myriad of coding, security, access and distribution possibilities. At the same time, broadband and wireless communication enable access to information and multimedia services from almost anywhere at anytime. From a consumer's point-of-view, the ICT- and multimedia market is characterized by a growing 'convergence' (Servaes & Heinderyckx, 2002, p. 92; Van Cuilenburg, 1998, p. 12; Van Dijk, 1999, p. 9) and an overload of multi-featured devices and applications. From a suppliers' point-of-view, ICT innovation seems to be a paradox. Lennstrand (1998) describes it by the question 'How come it goes so slowly when it goes so fast?'. On the one hand, liberisation and growing convergence resulted in a hypercompetitive, fast changing ICT environment, characterized by an increasing speed of innovation development and shortening product life cycles (Dogson, 2000, p. 19; Gaines, 1998, p. 7;

Haddon, 2004, p. 1; Marsden & Verhulst, 1999, p. 1; Van Riel, Lemmink, & Ouwersloot, 2004, p. 348). Poiesz and Van Raaij (2002, p. 32) are using the concept of an '*innovation spiral*' to illustrate this: due to the increasing competition, all competitors feel a stronger need to innovate, resulting in more innovation attempts. In this proliferation of innovations, it has become more difficult to distinguish innovations from each other, as suppliers move swiftly to the next innovation.

On the other hand, this environment is typified by a certain slowness: despite the promising prophecies innovations are introduced with, the number of failing innovations increases. As it becomes so difficult to distinguish oneself from the many competitors, more and more innovations get stuck in the chasm between innovators and some early adopters, and the rest of the market. Explanations are often sought in the lack of accurate insight into the end user's expectations, needs and wants at the early development stages, the absence of suitable methodologies, and the skipping of research stadia in the product development process because of time pressure (De Marez, 2006, pp. 142-165; De Marez & Verleye, 2004, pp. 33-34).

Both from a theoretical as well as from a market perspective, the above mentioned trends caused a clear evolution towards a more user-centric mentality or a shift from a 'push' towards a more 'pull'-driven mentality since the early nineties. The success of new products and technologies has become highly dependent on the experience of the user and his perception of the quality of this experience. As we will see further in this paper, concepts like '*Quality of Experience*' (Drogseth, 2005, p. 1; Enterprise Management Associates, 2002, p. 1) and '*user experience*' (Forlizzi, 2003, p. 1; Forlizzi & Ford, 2000, p. 419; Hassenzahl & Tractinsky, 2006, p. 91; Wright & McCarthy, 2003, p. 1), which can be framed within this more user-centric mentality, have started to acquire a central place in today's innovation and technology development literature. From a theoretical point of view, the evolution towards a more consumer-oriented paradigm has undoubtedly also been pushed forward by 'untraditional' approaches as Von Hippel's 'Lead User' theory, stating that lead users can serve as a kind of '*need-forecasting laboratory for marketing research*' (Von Hippel, 1986, p. 791).

To date however, most concrete efforts to anticipate for a good user experience remain limited to the 'big players'. Dell installed its 'Customer Experience council' in 1998, in order to scrutinize every aspect of how Dell interacts with its customers (Kirsner, 1999, p. 1). Other examples like Microsoft, providing Xbox 360-'lead users' with developer kits, or Philips - using a community of 'lead users' for betatesting in its leaduser.nl initiative - illustrate this growing importance of the user's opinion and experience within the development process. Unfortunately, these initiatives remain rather fragmented: users are often not imbedded in a continuous user-centric process. In most cases, they are only involved in one single stage (e.g. usability testing) or only in the final stages of the process (e.g. evaluating) (Haddon et al., 2005, p. 10). As both scholars and practitioners are confronted with the methodological challenge of more accurate user research in order to stimulate real user-centric product development, some important issues need to be tackled.

Within this paper, we will elaborate on the fact that Quality of Experience and its measurement became crucial aspects in today's competitive ICT environment. More specifically, we will focus on two major issues: As there exists much confusion and inconsistency about the definition and interpretation of this concept, we will first focus on the question '*What is Quality of Experience?*' The second challenge we try to tackle relates to the

question ‘*How should QoE be measured?*’: we will give an overview of today’s problems with regard to QoE-measurement and instigate a new approach.

Changed ICT-environment: changed role for the user?

With the growth of technology development, the use of technological devices (for instance ICTs) became widespread. As a result, consumers were faced with an increased opportunity of choice, as more and more innovations were ‘fired’ at the market. This boom on the supply-side led to an enormous empowerment of the consumer, who became a demanding, critical and self-conscious stakeholder. This changing ‘user role’ did not pass unnoticed within the HCI-tradition. During the ’70-’80s, the emphasis was on efficiency and functionality: developers and designers concentrated on the way people thought and processed information (Geerts, 2006; Tuomi, 2005, p. 21). Users’ expectations or subjective experiences were no part of the focus. From the late 80’s/early 90’s onwards however, people were seen as social actors and development/design teams started to recognize the importance of social aspects and dimensions (cfr. origin of participatory design, contextual design, ...) (Geerts, 2006). Since the late 90’s, we find ourselves in a situation where computers and technology in general are ubiquitous, and more importance is attached to the home-environment of people, to the influence of culture, emotions, experience, ... (Geerts, 2006).

This gradual ‘rise of the consumer’ must be framed within the broader context of some global views on technology adoption, development and management. On the level of theories on technology adoption, the diffusionistic paradigm dominated since the early 60’s (Rogers, 1995, p. 2003). Due to an increasing number of failing innovations (that could not be explained by the theory) and a lack of attention for the end-user, this technologically deterministic paradigm was countered by user-centered paradigms as the ‘social shaping of technologies’ and domestication-perspective since the early 90’s (Lievrouw, 2002, p. 185; Mackay, 1995, p. 42; Punie, 2000; Silverstone & Haddon, 1992). Recently, more and more authors adopt the ‘middle course’ of ‘interactionism’ (Boczowski, 2004; Trott, 2003): a perspective in which the success of technology adoption and diffusion is explained as a continuous synergy between technological and user/societal forces.

On the level of technology development and introduction, as we have seen, there was an identical shift from a more R&D-driven ‘push’-oriented mentality towards a more (marketing driven) ‘pull’-oriented mentality in which the user became the starting point of the technology development (Rickards, 2003, p. 1095; Trott, 2003, p. 836). But also here, more and more authors are convinced that reality is somewhere in between: in an interaction of push- as well as pull-forces (Bouwman, Van Dijk, Van Den Hooff, & Van De Wijngaert, 2002, p. 45; Crawford & Di Benedetto, 2000, p. 51).

Whereas Quality of Service and technical performance metrics received a lot of attention in the past, *Quality of Experience* is now the new ‘magical word’. The increasing importance of the ‘user experience’ is without a doubt closely related to the above mentioned change to a more consumer-oriented mentality. Kumar (2005, p. 39) illustrates this sharply when he says: ‘*The consumer is king – and needs high QoE*’. Quality of Experience should not be a goal in itself, but it does have important implications: if you provide your customers with a high QoE, they will be happy and satisfied (Nokia, 2004, p. 3), but if you don’t, you will create a ‘*customer experience gap*’ between what they want and what they get (Good, 2001, p. 4). These gaps are usually caused by a lack of insight in the totality of dimensions of a customer’s experience. Too often, developers, designers or managers are aware of the importance of the customer’s experience, but their approach remains too narrow (in an

instrumental way, in terms of optimizing QoS, ...). As a result there often remains an 'experience gap', although the product or service was intended to increase the customer's Quality of Experience.

In order to anticipate what the user expects and experiences, he should be involved in the development process. As mentioned earlier, some big players or industries (e.g. gaming industry) already involve users in certain stages of the development process of a new technology or application. But there still remain a lot of difficulties concerning the role of the users, the timing (at what stage of the process?), the actual process of involving the users (what Limonard & de Koning (2005, p. 176) call '*the dilemma of user involvement*'), the type of users that should be involved, etc. (Haddon et al., 2005, pp. 9-10). In this respect we can refer to Von Hippel again: *when it comes to market research for novel products, it is the specific category of 'lead users' that is best suited, since their needs represent the future needs of the whole market* (Von Hippel, 1986, p. 791). Von Hippel's theory is only one example of involving the user in the NPD process. But in order to measure the user's expectations and Quality of Experience as well as involving him in the development process from the early stages onwards, we first need to tackle the methodological and conceptual challenges that Quality of Experience brings along.

Rise of the user and his '*Quality of Experience*'

Following Pine and Gilmore's 'Experience Economy' (1999), experience has become a USP or '*competitive battleground*' (Kirsner, 1999, p. 1). There has been a shift in value from 'products' to 'experiences' as the customer wants to see his needs fulfilled (Lawer, 2006). In the changed, highly competitive ICT-environment, the consumer has risen as a powerful stakeholder: he became more demanding as the intense competition between the many suppliers of a same functionality allows him to. He can easily switch from one supplier to another when he has a bad experience. His purchase decisions are now mainly based upon his (perceived) Quality of Experience, while the QoS concern of the end consumer has actually become a non-issue (Van Moorsel, 2001, p. 8). In this respect, Jain (2004, pp. 96-97) points out the difference between on the one hand 'innovators' and 'early adopters' and on the other hand the 'mass market': the former will base their purchase or adoption mainly on the technology, functionality and QoS of the product, while '*normal users care more about the problem the product solves and their experience while using it*'.

But Quality of Experience is not only important for adoption purposes, it's at least so important for loyalty purposes: good experiences will also promote customer satisfaction and customer loyalty (Kumar, 2005: 37). At the same time, satisfied customers will lead to a positive market perception and will prevent market dilution. All these elements can help the company to create a relative advantage and maintain its competitive edge (Nokia, 2004, p. 3). Munnecke & Van der Lugt (2006, p. 8) take it one step further when they say that user values and experiences are the '*dominant key values in future markets*'. values that should be at '*the very centre of the innovation process*'. Which brings us to one of the main problems: it is clear that delivering good experiences should be a top priority, but how should this be done? And how can it be done in a way that users are closely involved? Or put differently: '*How do we go beyond the simple platitude "focus on the user" and build our products and services in ways that lead to great experiences?*' (Miller, 2005, p. 90). Drogseth (2005, p. 61) describes the problem in terms of cognitive dissonance between what the priorities of technology managers are (QoE, user-centric approach) and what they actually do (QoS, technology-centric approach). According to Mulder and Steen (2005) '*many projects aim to put end-users central and aim to combine multiple perspectives, but very often this ambition is not*

completely realised. For example: end-users may be invited to react to prototypes only after they are finished.'

Two of the main reasons for not being able to succeed in going beyond this 'platitude' is the lack of a concrete definition and clear conceptualization of the QoE-concept and the lack of a good QoE-measurement approach.

Two challenges

Within the scope of this paper, our first aim is to propose the conceptual model of QoE, that was developed during an ongoing IBBT¹- project² on End-to-end Quality of Experience. This model is intended to serve as a base for a new and approved QoE-measurement approach. A first step towards the construction of the model consisted of an exploration (desk research, literature study) of the current definitions of QoE and the confusion and diversity in today's approach. At the same time, we made an appeal to a panel of 12 national and international experts on QoE. In order to compose the panel, we used both literature, seminars and conferences. As an expert were considered those that recently published on the QoE topic, or practitioners involved in researching and managing QoE. The panel was consulted by means of an online survey on QoE definitions and statements.

In an attempt to tackle the second challenge, we examined how QoE-measurement should be best dealt with in order to make new product development processes more user-centric. To date, this is still not done well enough. Despite big companies doing efforts to involve 'innovators' in different stages of the process, QoE measurement often remains a fragmented and insufficient effort because of the lack of the necessary insight into the QoE-concept to create a comprehensive measurement approach. An approach in which innovators certainly have an important role to play, on the condition that this is part of an overall process of synergetically combining methods to involve the user.

Challenge 1: QoE conceptualisation, today's problem for QoE measurement

The central question to be answered here is '*What is Quality of Experience exactly?*' And what makes it so different from other related concepts? Compared to the concept of 'Quality of Service', the QoE-concept is of a more recent date. Whether on the application, network, server or device level, QoS has a rich tradition in engineering and developing environments. The 'semantic variant' Quality of Experience only emerged since the late 90's, when the user, his experience and user-centric design became more important (cfr. supra). For a long time the 'quality'-concept (when related to ICT-projects and services) had a very narrow interpretation in terms of technical parameters and performance metrics in other words, and only recently the 'quality for the user (and of his experience)' became more important. In the definition of this more user-centric quality concept of QoE, the narrow technological interpretation often stays dominant however: Kumar (2005, p. 37) for example defines it as '*... the qualitative measure of the daily experience the customer gets when he uses the services he is subscribed to – including experiences such as outages, quality of picture, speed of the high-speed internet service, latency and delay, customer service, etc, ...*'. Other authors as O'Neill (2002, p. 1) or Van Ewijk, De Vriendt, & Finizola (2006, p. 1) define QoE in a similar, rather narrow and QoS-alike way.

¹ Interdisciplinary Institute for BroadBand Technology (Founded by the Flemish Government: www.ibbt.be)

² More info on the E2E QoE-project can be found on the project website: <https://projects.ibbt.be/qoe/>

Parallel with the rise of the user and traditions like HCI, also the increasing popularity of the usability concept found its translation into QoE-definitions (e.g. Nokia's vision on QoE in the context of 'mobile data services' (Nokia, 2004) or Alben (1996)).

Obviously, QoS and usability are key dimensions for a definition of Quality of Experience; but they can not be the only ones. Several authors emphasize the 'multidimensional' character of QoE (Drogseth, 2005, p. 61; Forlizzi & Batterbee, 2004; Gaggioli, Bassi, & Delle Fave, 2003, p. 121; Hassenzahl & Tractinsky, 2006, p. 91; Kirsner, 1999, p. 1). Some stress the importance of the user's '*emotions, expectations, and the relationship to other people and the context of use*' (Arhippainen, 2003, p. 1), while others describe it as a '*subjective and holistic phenomenon, where users construct the eventual experience within the settings afforded by the environment*' (Vyas & Van Der Veer, 2005, p. 1).

Conclusions from the desk research were legio: QoE definitions are often 'too narrow' in terms of QoS and usability, most authors agree on the multidimensional character of the QoE-concept, but there remains much inconsistency about the very (sub)-dimensions QoE is based on. Literature learns that QoE-definitions should also account for dimensions like context, expectations and perceptions, next to the more technologically-inspired QoS dimensions.

An echo of this was found in our expert panel³. Among the QoE-definitions of the 12 experts in our panel, we noticed a broad diversity and the same dimensions recurred: multidimensionality, technical QoS-metrics, subjectivity/perceptions, meeting expectations, context and usability.

Returning to the question: how QoE should be approached, it is clear that QoE is more than just the 'instrumental QoS- and technical inspired' concept it often is regarded as (Hassenzahl & Tractinsky, 2006, pp. 92-93; McNamara & Kirakowski, 2005, p. 201). With input from both the desk research as the expert panel, we tried to build a conceptual model, covering the most important QoE dimensions and integrating the formerly too much separated visions (which was lacking (Wright, McCarthy, 2003, p.1), with the aim of enabling better measurement and understanding of the QoE-concept.. Starting from a model in which all the elements provided by the literature and the different experts were integrated, we ended up with a model consisting of five main building blocks (the conceptual model with all its subdimensions can be found on the next page):

(1) Quality of Effectiveness (~QoS)

This dimension represents the traditional 'Quality of Service' approach on QoE. QoS doesn't equal QoE, but a performant technology or service is in most cases a first prerequisite to achieve it. Therefore, this 'building block' is all about the accuracy and technological performance, at four levels: a) application/service, b) server, c) network, d) device/handset.

³ The first question in the online survey was an open question in which the experts were asked to define QoE. Next, after the list of statements and the reactions on these statements was completed, the experts had the opportunity to adjust their initial definition.

(2) Usability

The second dimension, usability, is already integrated in many QoE-definitions. In most cases it is however approached in terms of ‘behavioural usability’: focused on the ease of working, user friendliness, the man-machine interaction (Argogroup, 2006; Nokia, 2004, p. 3; Velthausz, 2005). Often neglected here is the ‘emotional usability’: the emotions and feelings of the user when using the device or technology (e.g. *‘is the technology user friendly enough for the user to have a good feeling?’*) (Gaggioli et al., 2003, p. 127).

(3) Quality of Efficiency

This dimension is meant to cover the subjective character of Quality of Experience. A certain type of interface will be very clear for one user, while it remains very complex for another. Central question here is: *‘is the technology working good enough for the user?’* For this dimension, we distinguish between three levels: a) device/handset, b) network and c) application/service. In technical terms, a technology may be performing very well, but at the same time this may not be efficient enough to satisfy the user or meet the user’s expectations. In this respect, Jarvenpaa & Lang, (2005, p. 7) point out the fact that *‘users’ experiences with technology are often paradoxical’*.

(4) Expectations

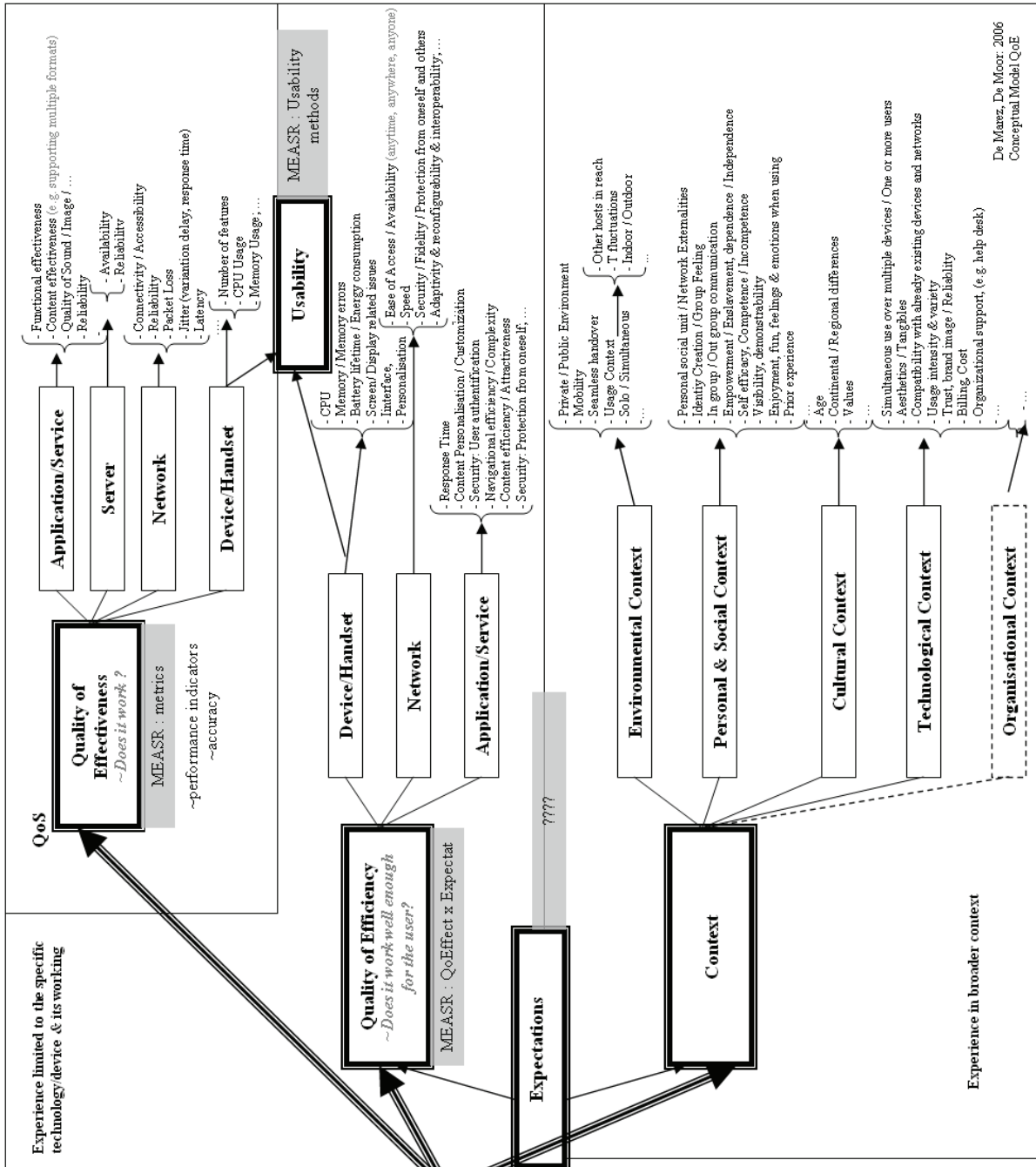
This fourth dimension is included in the conceptual model to enable the measurement of the previous subjective dimension (Quality of Efficiency) in an adequate way. Only when you have an insight in the user’s expectations, conclusions can be made about whether a technology is working well or sufficient enough for that user. The degree up to which the expectations are met, will then determine the Quality of Efficiency.

(5) Context

For a comprehensive approach of Quality of Experience, it is also necessary to consider experience in its broader context. Also for this context variable, it is necessary to distinguish between several sublevels. We distinguish between five types of context: a) environmental, b) personal/social, c) cultural, d) technological and e) organisational. The expectations users have, can depend on the context they find themselves in.

With these 5 dimensions, we tried to be complete the model on the level of ‘main building blocks’, but referring to the fact that QoE is really a subjective and ‘open-ended’ matter (Drogseth, 2005, p. 64) it’s important to stress that the conceptual model cannot be considered as exhaustive on the level of subdimensions. Summarizing, this proposed model was constructed with the intention to cover not only what the technology does (QoS, performance measurement), but also what people (can) do with the technology, what people want/think to do with it and expect from it, in what context people (intend to) use it, and up to what degree it is meeting their expectations and resulting in an ‘end-user happiness’.

Having this conceptual model as a starting point for better QoE measurement, we can move on to the the second question *‘How to measure Quality of Experience?’*



De Maess, De Moor: 2006
Conceptual Model QoE

QoE-measurement: today's problem

According to Vyas & Van Der Veer (2005, p. 1) the '*era of user experience*' and the rise of Quality of Experience have challenged designers and developers '*to understand human experiences and apply them into the design process*'. Also others emphasize the importance of gaining insight in the user's experiences and expectations during the NPD-process (Arhippainen, 2003, p. 2; Von Hippel, 1986, p. 791; Vuckovic & Stefanovic, 2006, p. 207), but its practical implementation still shows a lot of shortcomings due to ignorance, questioned credibility and value, market evolutions (cfr. supra), ... (Anderson, 2004, pp. 2-3).

To date, a major issue is the technological determinism in the practical approach of Quality of Experience. This can be seen as one of the main reasons for the lack of user involvement. The technological sky is the limit, and there are no concerns about what users want. Developers often wrongly assume that new applications and so called technical optimizations will self-evidently lead to a better experience (Jarvenpaa & Lang, 2005, p. 7). Quality of Experience is usually measured in terms of technical metrics (~QoS), ignoring the fact that the ultimate goal should not be to deliver applications with the most advanced features, but to deliver products that will ensure a good Quality of Experience (Coninx, Luyten, & et al, 2003, p. 17; Empirix, 2001). In today's ICT environment however '*it is no longer sufficient to just deliver products which have technical excellence*' (Bevan, 1999, p. 89). Users should be involved throughout the whole development process (not only in the evaluation phases), and insight in the user's expectations and requirements should even serve as a starting point for the development of a new product or application. We already mentioned the efforts of some of the big players within the ICT environment to involve (lead) users or innovators in the NPD-process in this respect, but once again, we would like to stress that these are rather exceptional cases where users are involved in parts of the process.

Secondly, as Quality of Experience often gets a narrow, technical and QoS-alike interpretation, it is mainly measured in terms of technical metrics. Many authors criticize this approach when stressing the multidimensional character of the concept of 'user experience' (Arhippainen, 2003, p. 3; Buchenau & Fulton Suri, 2000, p. 1; Forlizzi & Ford, 2000, p. 424; Gaggioli et al., 2003, p. 121; Jain, 2004, p. 96). Measuring the subjective dimensions of experience is often skipped or neglected because of the shorter product life cycles, time pressure, budgetary reasons, ... (McNamara & Kirakowski, 2005, p. 201), or simply because of ignorance.

This brings us to the problem regarding today's QoE-measurement practices: no consensus about the methods to measure QoE and a lack of knowledge of the existing methods (which (sub)dimensions do they measure? when can they be applied?). For the dimensions that are not measured in the current approach, a reorientation of existing methods and methodological renewal is required. According to Kort, Steen, de Poot, ter Hofte, & Mulder (2005, p. 1) the existing methods are not suited for the intended insights: '*They are too focused on task performance and usability issues, while research interests have changed and broadened to include context and user experience ...*'. Indeed, the main measurement-challenge is to go broader than just the performance and QoS-aspects: it's about gaining insight into what the user really experiences, from his own perspective (Arhippainen & Tähti, 2003, p. 27; Ehr, 2003, p. 1).

The identification of the most important problems and issues concerning the measurement of Quality of Experience, brings us to the crucial question: how should QoE be measured?

QoE-measurement: how it should be done?

From the discussion of the conceptual model, we have seen that QoE is a multidimensional concept: five major building blocks were introduced. This means that measuring only one or two dimensions (QoS and usability) is not sufficient: *'Experience does not exist in a vacuum but in dynamic relationship with other people, places and objects. Furthermore, the quality of human's experiences changes over time because different contextual factors influence on it'* (Buchenau & Fulton Suri, 2000, p. 1). Consequently, QoE should be measured in all its dimensions!

Equally important, is the stage in which these measurements occur: the measurement of QoS and QoE traditionally happens 'ex post', after the user has experienced a finished product. More stress should however be put on the expectations 'ex ante'. What is needed is a so-called '*predictive approach*', that focuses on the user and his QoE from the first phases of the NPD-process onwards (Ishibashi & Tsykin, 2004, p. 135). Arhippainen & Tähti (2003, p. 27) attach a similar value to user research in these early development phases. They see it as necessary condition to gather information about the end-user, his expectations and needs. In this respect, it's also worth mentioning Raina (2006, p. 2), who looks at QoE from a market perspective: in his 'Customer Happiness Mantra', he explicitly underlines the importance of knowing what the user expects (Expectation of Quality, or EoQ). This 'Customer Happiness Mantra' is $EoQ=QoE$, or in other words, when the expectations equal the experience, your customer will be happy and satisfied. A problem that may arise with these early expectation measurements however, relates to what Limonard and de Koning (2005, p. 176) call the '*dilemma of user involvement*': users cannot always articulate their expectations or predict what they expect to do with certain devices or applications. Innovators and 'lead users' (cfr. Von Hippel) might be very useful user categories here to overcome the familiarity and involvement problems concerning users in the early phases of the development process.

We have seen that the existing measurement approaches and efforts to involve the user, are too fragmented and not well integrated in the whole development process. From the literature and our expert panel, we learned that QoE-measurement can only be successful when it regards an integrated, continuous flow: '*QoE is a journey rather than a destination*' (Enterprise Management Associates, 2002, p. 3). Needs and expectations are influenced by several factors, so what is needed is a continuous, synergetic process. The overall process should consist of several interaction moments with users. This interaction idea is supported by several authors (Arhippainen & Tähti, 2003, p. 27; Corrie, Wong, Zimmerman, & et al, 2003, p. 1; Forlizzi & Ford, 2000, p. 419), as by the majority of the experts we consulted. The general flow is divided into several stages, as each step of the process raises other questions and requires other methods to gain the necessary insights. Inspired by other authors who opted for a phased approach (Lindgaard, Dillon, Trbovich, & al, 2006, p. 48; Mahadevan, Braun, & Chaczko, 2004, p. 3; Velthausz, 2005, p. 48), we chose to work with the three phases of the new product development-process: 1. prior-to-development and prior-to-launch, 2. post-development and prior-to-launch, 3. post-development and post-launch. Combined with the main dimensions of QoE, taken from the conceptual model of QoE, we propose a more user- and QoE- driven flow in these three phases, measuring five building blocks: Quality of Effectiveness, Usability, Quality of Efficiency, Expectations and Context.

Today's methodologies: suited for the flow?

In order to be able to propose an ‘optimal measurement flow’ for Quality of Experience at some point, a first and crucial step consisted of a critical screening of the existing methods for QoE-measurement, and other methods from several disciplines that could be useful for this purpose. Within the scope of the IBBT-project on QoE, this ‘screening exercise’ resulted in a list of over 60 multidisciplinary methods, both quantitative and qualitative. The following and ongoing step includes the integration of these methods in a QoE- measurement 3x5-matrix, which is made up of the three phases from the NPD-process and the five main QoE-building blocks that were identified previously (cfr. supra). For the plotting of the methods in the matrix, they are judged on their suitedness to measure a specific QoE-dimension and to be applied in a particular phase of the development process.

In first instance this judgement, is based on literature and the consultation of a ‘methodological expert panel’. Unlike the expert panel that was consulted in the conceptual phase, the people in the second panel are not necessarily having an expertise in QoE: they are experts in a particular (methodological) field (e.g. working with lead users, usability, participatory design, foresight ...). In second instance, the judgment of methodologies is based on empirical findings: in the context of our QoE project, a number of methods to involve users in the process are tested in different case studies (e.g. Playstation 3-case, translation workshops, VoD-case, Videoconferencing-case,...).

Final aim is to come up with optimal solutions for the methodological challenge that QoE is entailing, and to point out those cells where there exists a hiatus, or confusion about how and when a certain method can be used and eventually, to propose a toolset for a user-centric approach to QoE-measurement.

Completing the flow...

In our interpretation of the flow-idea, every decision that has to be taken during the user-centric development process (eg. when to involve users, what type of users should be included, the scope and objectives of every user-centric exercise, the choice of suited methods...) will depend upon the very stage of the development process. In each stage of the process, other Quality of Experience-dimensions (and subdimensions) will namely be emphasized. For instance, during the *prior-to-development and prior-to-launch phase*, involving the user is in many cases considered as unnecessary, or simply skipped because of time pressure or ignorance. Yet as we have seen, a good Quality of Experience equals a match between the actual experience and the expectations before launch. So involving the user in this phase and getting insight in his *expectations* and requirements with regard to the technology or device, is crucial! Another important dimension here is *context*: how will the environmental, technical, personal & social, cultural... context influence the user’s expectations and experiences?

For the second phase (*post-development and prior-to-launch*), it is clear that more stress will be on usability testings on the prototype(s), on the Quality of Effectiveness (the technical aspects of the demo(s) or prototype(s) of the technology, device or application) and to a lesser degree also on the Quality of Efficiency (does the prototype/demo work well enough for the user?). In the third phase we mainly situate the traditional *post-measurements*: in this stage, the actual user experience can be measured in all its dimensions (both on a objective and a subjective level).

The ongoing process of integrating the methods into the QoE-matrix is organised as follows: every method is judged on her suitedness to measure one or more subdimensions of QoE and

the degree to which she is usable for one or more phases of the development process. Next, the different cells in the matrix, are given a colour: a *green cell* indicates that a suited method was found to measure a particular (sub)dimension at a specific stage of the process (eg. prior-to-launch). An *orange cell* means that the proposed method could be suited, although it still implies some problems (methodological issues, disadvantages from the literature, experiences from own user research, ...). And finally the *red cells*, represent those QoE-dimensions, for which no solution has been found yet (for that particular stage of the process): a red cell is in other words a hiatus in the methodological 'store' for user-centric product development.

As mentioned above, with our own empirical research, we try to evaluate several methods on their suitedness to involve users in the development process and to measure certain QoE-dimensions. Within the QoE-project, the case-studies are organised around four common scenarios: VoD, Videoconferencing, 3D-Gaming and networked videosensors.

Case-study Playstation 3 (3D-gaming scenario)

With the release of Sony's newest game console in Europe⁴, we invited two groups of users to participate to a qualitative 'game-experience study' in three phases. The first group consists of 5 innovators or 'lead users'⁵. The second group (N=5) consists of more moderate gamers (early adopters – early majority): the participants from this second group all possess a number of game consoles and are very interested in (the launch of) Sony's newest game console, but nevertheless they are not interested in purchasing it right away.

Both groups were invited for a PRE-measurement workshop (prior-to-launch) at the beginning of March: with this, we intended to measure their 'expectations' towards the new console *ex ante* and to find out more about their current game-experiences. Within these workshops, a combination of methods and tools was used: brainstorming and free listing, focus group method, prioritising, expectancy value forecasting and image gap. In addition, the first group was invited to participate to a diary study: they were asked to fill in a 'game-experience form' every time they played a game on one of their game-consoles. The second group⁶ was invited to come over to test the Playstation 3 in our own test-space.

Both groups will be invited once again for a POST-measurement workshop (which will take place in April), to tell us about their experiences with the Playstation 3 console. At these sessions, the user's initial expectations (before launch) and their actual experiences will be compared. We will look for possible 'experience gaps', for differences between the two user groups, assess the experiences from the diaries ...and by doing this make an evaluation of all the methods that were used in this case-study.⁷

Conclusion

The outline of the changed ICT-environment led us to the evolution towards a more consumer- and user-centric, 'pull'-driven mentality from the early nineties on. In this respect, the concept of '*Quality of Experience*' acquired a central place in the literature, as the success or failure of new technologies has become highly dependent on the user's experience. As a result, gaining insight in this 'Quality of Experience' can be seen as a necessary condition for delivering good experiences.

⁴ The European release of the Playstation 3 console took place at March 23, 2007.

⁵ We defined 'innovators' or 'lead users' here as people who had already ordered the console well in advance and who usually buy a new game console right ahead after its launch.

⁶ This was the group that didn't intend to purchase the Playstation at or immediately after the release.

⁷ Results of this study will be available at the time of the conference.

We identified two major challenges with regard to QoE. As there exists a lot of inconsistency and confusion about the definition of the QoE-concept in the literature, the first challenge was related to the question: *'What is QoE'*? In order to tackle this challenge, a conceptual model for QoE - consisting of five major building blocks and many subdimensions - was presented. With this model, we aimed to stress the multidimensional and subjective character of the QoE-concept and propose the base for an improved measurement approach for QoE. Another important observation (i.e. the lack of a good measurement-approach) served as the base for our second challenge: to instigate *a new user-centric approach for QoE-measurement*. In this respect, the most important problems were listed and a number of suggestions for a new approach were made: QoE should be measured in all its dimensions, it should regard an continuous, synergetic process, that consists of several interaction moments with users. Only if users are involved throughout the whole development process, their expectations, needs, experiences...can be anticipated, leading to an optimal end-user experience. As we have seen, some big players have already made their first attempts to valorize the above mentioned mentality-shift. From these initiatives, it is clear that innovators and lead users can have an important role to play. They are however still too fragmented, limited to a certain type of users, not well integrated into a whole, continuous user-centric development process...

Good measurement also implies choosing the right methods and gaining insight in the strenghts and weaknesses of these methods: we gave an overview of our ongoing methodological research for QoE-measurement, and the integration of methods into a QoE-measurement matrix. As we saw, the judging of the suitedness of methods is based upon literature, a methodological expert panel and our own empirical findings. Final aim here is to come up with optimal solutions for the methodological challenge that QoE is entailing.

It is clear that the product development process in the context of the changed ICT-environment would benefit tremendously from a *real* user- and QoE- centric approach. Doing this means that the user and his experience are placed at the heart of the innovation and development process. Question is now, who dares to take up *this* challenge?

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Dealing With User Generated Content: Adjusting Information Managers' Source Selection And Information Quality Assessment

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1. Abstract

The development of online content creation tools and social software has a significant impact on corporate environment. For a long time, the internet has been seen as a challenging workspace for Corporate Communication and Information Management purposes. It enables a growing number of people to publish, share and relay information (facts, opinions or contacts) on any subject they see fit. A number of authors have studied the way Information Managers face new opportunities and risks created by those new flows of information, especially as regards sources selection and information processing. The recent emergence of user-friendly content creation tools and networking facilities, consubstantial with Web 2.0, has increased that phenomenon, opening the discussion to a new range of information sources: the ordinary user/client/consumer.

This paper aims to present a theoretical confrontation of usual information evaluation criteria - arranged in a checklist of 76 sub-criteria- (Cooke, 2001) to 5 formats of information sources, considered as specific to the recent transformation of informational landscape (Kolbitsch & Maurer, 2006): weblogs, wikis, podcasts, file sharing and social networks platforms. The confrontation consist in a rating of each sub-criteria as *less* (-1), *even as* (0) or *more* (1) *important than before*.

Our results show a significant impact of technical changes on the information evaluation process, balanced by growing concerns regarding authority. A detailed reading of criteria indicates lots of changes, even though a broader analysis highlights a relative status quo. This suggests that the evaluation process remains globally the same, but that it mostly needs to be rethought and reorganized to better cope with the new reality of new types of sources.

2. Introduction

Assessing information quality and providing resources to improve sources selection has always been a subject of intense attention in the field of Information Sciences. On the practitioners as well as on the academics side, those issues remain crucial for all kinds of "audience". For years, information has been identified as a major asset which enables people or organizations to reduce their environment uncertainty and help them in optimising their decision processes (O'Reilly, 1982; Hardy, 1982, Culnan, 1983; Schultz & Leidner, 2002). The characteristics of the channels used to convey information have an impact on the information selection and evaluation processes. Its form and its content reflect methodological and editorial processes that the user must take into account. Is the information reviewed? Who is the initial source? For what purposes was it generated? These questions are neither new, nor even recent. For every new means of communication which is adopted by a significant number of people or groups, information evaluators need to adapt their analysis methods to cope with the new channel and the resulting new situation. This can be observed in the recent evolution of Information and Communication Technologies (ICTs) and especially the content creation tools supported by the Internet as a global platform.

Authors usually agree that "the need to filter and select the most appropriate source and manage information requirements effectively is compounded due to the exponential rate of growth of literature via diverse media, resulting in information overload, and the lack of knowledge and skills on the part of managers to maximize the available resources" (de Alwis & al., 2006).

This paper aims to cover this phenomenon from particular theoretical and contextual points of view. Today, the informational landscape has become more complex and difficult to categorize than ever. Sources of information are multiple and vary in their design and content characteristics. Consequently, proposing a practical or stable typology for them is virtually impossible. Every attempt needs to adopt the most effective point of view to reach its objective, the consequence thereof being a limited vision of the observed environment. This paper focuses on that particular issue and should be read and understood as such.

2.1 Scope of research

From a theoretical point of view, the scope of research will be limited to organizational information management, i.e. on how companies, institutions or organized groups deal with the information related to or coming from their environment. This systemic position is proposed in order to simplify the global understanding of the phenomenon. There are obviously other relevant epistemological postures, but this article purports to refer to very different fields of knowledge such as Information Sciences, Internet Studies, Media Studies, Knowledge Management, Corporate Management, etc.

In this article, we will underline the difference between paper and electronic forms of information channels, and disregard the interpersonal exchanges of information. Following these choices, special emphasis will then be given to the specific electronic context of information channels. Source selection and information quality evaluation are once again challenged by the evolution of information channels as they appear mainly on the Internet, which will be our main focus, even though similar changes can be seen in non-electronic means of information (books, printed newspapers, academic journals, etc.). As they have existed for a long time, it is believed that the process of their selection and quality evaluation has remained unchallenged by the evolution presented in this research. Yet the underlying assumption is not that the assessment of that content is a perfectly mastered process. With the corporate posture taken here, special attention will be paid to the Information Management processes (IM). The IM concept may be defined in different ways. Previous studies have led us to assume that there could be as many definitions of IM as people to define it. Therefore, we have built our own formulation of the concept, based on review of the literature. Information managers with an interest in this paper are professionals whose main assignment consists in managing information, where IM is:

Individual or collective set of actions aiming at grasping information coming from its environment, in order to anticipate a given situation or a broader trend, at a given time, and to react to take benefits of it, after an appropriate processing and relay. Those actions are realized by information mediation (gathering, processing, distribution, etc.) and differ from their main goal: threats and opportunities detection, help on the decision-making process and influence actions.

The main objective of this research is to observe, analyse and understand how channels of communication which have appeared on the Internet (and especially web-based content creation tools) affect the way organizational IM teams select their sources and evaluate the quality of information.

2.2 Context of research

With the development of the World Wide Web (WWW) within professional and private spheres, as information provider and communication channel, organizations have taken up the challenge of dealing with new kinds of content produced by sources not necessarily known or assessed (Marsden & al., 2002). And this simple observation does not refer to recent years but is older than a decade. Scholars and professionals have been dealing with that phenomenon and have rethought the way information quality could be evaluated. Within organizations, Information management systems have been developed to cope with the progress of digital communication devices and networked computers. Following that trend, a number of authors have proposed methods in order to help practitioners and developers (Lazonder & Biemans, 2000). These methods are multiple, ranging from theoretical frameworks (DeLone, Mc Lean, 1992), to guide books (Alexandre & Tate, 1999; Cooke, 2001) or even actual automated tools (ISI rankings for example). The general trend described here has been accelerated in recent years by the fast growing phenomenon known as 'Web 2.0'. Authors suggest a scale shift with the Internet, following much ancient research (Huber, 1990; Auster & Choo, 1994, Graef, 1995; Graef, 1996): "anybody can express and publish its content" and make it available. If such statement could be made in the nineties, then surely the phenomenon addressed in this paper is not new. Yet we intend to "renew" it.

Kolbitsch and Maurer (2006) summarize their view by claiming that the traditional model is challenged by community-driven services which weaken the usually clear distinction between information providers and consumers. They argue that it is not driven by technology *per se* but by a mind shift that encourages individuals to take part into the development and creation of new structures and new content. Users become innovators.

It is not the purpose of this paper to discuss the extent to which Kolbitsch & Maurer are correct. A literature review (on terms such as Web2.0, Internet, blogs, wikis, trackbacks, etc.) shows a growing interest in academic circles for Web 2.0-related phenomena. Until a few months ago, it was difficult to consider them from a scholarly point of view. But this situation is about to change. Web 2.0 is currently becoming a concept, supported by empirical findings, and will soon be defined by scholars, losing some of its weaknesses in the process, i.e. its marketing buzzword use, its origins, the fact that it was firstly based on nothing more than "ideas", etc. (Hoegg & al., 2006).

Web 2.0, or whatever the trend may be called, is characterized by technical features which are relevant to our purpose. Tools such as blogs, wikis, social networks, etc. are nothing else than content generation tools enabling any individual to become an author on the web, easily and cheaply, and to contribute to the overall flow of information. Businesses can illustrate the potential impact on organisational IM. Consumers and clients are now able to share their opinions, positive or negative, about a product with others, users or not. Today, mainstream media (i.e. traditional channels of information such as television, newspapers, radio, etc.) often disseminate information first and foremost on the ground that it is new (or even unusual) content. This implies that information managers have to adapt the way they watch their sources, but also how they select, assess and process the information coming from these media. (Kolbitsch & Maurer, 2006). One characteristic which may be observed in parallel to the Web 2.0 trend is the improvement in media richness thanks to technical development. In addition to text and links, a large variety of file sharing platforms has appeared: sounds, films, pictures, etc. (Kolbitsch & Maurer, 2006). This media richness has been demonstrated by several studies (de Alwis & al., 2006) as a factor influencing information seeking preferences (Daft & Lengel, 1986). These authors highlighted four aspects in the process: facilitating rapid feedback, handling multiple cues simultaneously, establishing a personal

focus and language variety that can convey understanding. At the time of their research, Daft and Lengel discussed face-to-face communication as the preferred source of information, and one can speculate that the media richness of Web 2.0 uses the same success factors. In addition, some authors go further by describing in a very simple and clear way the context of the informational landscape shift due to ICT's evolution and Internet activities development. They indicate that the specific task of information validation is no longer the prerogative of professional information mediators. It is the average user who is now responsible for his or her own evaluation process (Serres, 2005), which is what this research purports to show.

3. IM and the Web challenges

As this paper focuses on sources selection and information quality evaluation, we will reduce the scope of IM to the information seeking process. It offers an effective "keyword" for achieving searches and refers precisely to the object of the study.

It is broadly accepted that ICT have an impact on the organizational workplace (Kallinikos, 2005; Merono-Cerdan & Soto-Acosta, 2007). de Alwis & al. (2006) published in 2006 a high quality literature review of the transformation in information managers' seeking behaviours. They justified their work by the fact that "the increasingly technology-based workspace offers managers a dynamic and interactively digital environment facilitating constant and instant connectivity via networked personal computers". More than the choice of new information, it is also a vast range of information sources and channels and the concept of information "anytime - anywhere" which are observed. Managers are under scrutiny because of the lack of coverage they have been subjected to. Similarly, this observation may be extended to all IM people in an organization as the definition of the concept given by the authors is: "a person in charge of a formal organization or its subunits". Furthermore, information seeking behaviour is considered in their review as "the behavioural approach to seeking and handling information at work."

de Alwis & al. also argue that information seeking reflects a relationship between work settings and information environment. Information is required at two levels, i.e. an immediate one to achieve operational decision-making and a broader one used for long-term strategic planning. The authors' review shows that managers (and information managers) have preferences for certain information sources (personal face to face, internal documentation, etc.) with a particular interest for Intranet/Internet based sources. Some studies have shown that web-based tools are mostly used to seek information, read on-line news and participate in discussion lists with a tendency to return to trusted and familiar web sites. More recent work has stabilized the assumption that ICT have revolutionized the workspace with "ready access to a vast array of information sources and channels at the touch of a button via networked PCs." When reviewing studies of the new millennium, de Alwis & al. (2006) identified the growing interest of scholars for new kinds of sources of information such as the web or corporate portals, a point we will expand on later in this article. What is important at this stage is to understand that the impact of information channel characteristics has always been considered as a potential influence on IM information seeking behaviour.

In the specific context of Information Management, authors have considered the impact of the Internet on the information seeking process (Auster & Choo, 1994, Graef, 1995, Graef, 1996; Cronin & McKim, 1996; Kassler, 1997; etc.). Teo & Choo (2001) published an article specifically related to the impact of the Internet on Competitive Intelligence (CI). They define CI as "the process of knowing what the competition is up to and staying one step ahead of it, by gathering information about competitors and ideally, applying this information in short- and long-term strategic planning." The concept of CI may be considered as a part of the

concept of IM, and the general analysis of Teo & Choo has proved to be applicable to the whole definition given above. They indicate, supported by different authors, that the information richness and hypermedia capabilities of the Internet have led CI professionals to exploit it for different purposes: monitoring other players in their environment, tracking customers' views on products, broadening their reflection by gathering files, reports and studies from different types of sources, etc.

Their studies present the links between the Internet and the quality of CI information. More precisely, they introduce three hypotheses related to the use of the Internet: research, internal and external use. Results suggest that the use of the Internet is strongly related to the quality of the Internet, which is itself, as previously shown, related to strategic advantages improvement. The study supports the Internet as an Information gathering tool. The hypothesis of internal use of the Internet was not supported but external use has a significant impact on CI information quality, specifically for dissemination of information, collaboration, etc. the conclusion of Teo & Choo (2001) is explicit, in that companies have to call attention to the Internet in order to understand how it has changed its intelligence landscape.

Earlier, Choo, Detlor and Turnbull published a now seminal book entitled *Web Work-Information seeking and Knowledge Work on the World Wide Web*. It offers both theoretical and empirical findings on the subject. It compiles most of the major studies on the subject of information seeking and concludes with an empirical study of the use of the web by knowledge workers. It indicates, among other findings, that the WWW is the second-most preferred type of external source but also the second-most highly-rated source in terms of relevance and reliability. It is obvious that the Internet as a channel of information flows is part of IM professionals' daily work (Pikas, 2005).

4. Information evaluation criteria confronted to new type of online sources

Articles and books offer considerable help to evaluate sources and information quality. Website and education courses are available, often freely, and take part into an overall trend in users' training. These guidelines aim to help and raise the attention and vigilance of users (professionals or not) to the traps and the tricks specific to online sources (Serres, 2005). Two kinds of content have been found during our literature review: theoretical approaches on information seeking behaviours, sources selection and information quality criteria and practical books or web pages. On the one hand, academic articles often present empirical surveys on the information seeking process, testing it fully (Alfirevic & Racic, 2004) or partly (Lazonder & Biemans, 2000; Jaques & al., 2004), focusing on specific types of workers (Hirsh & Dinkelacker, 2004) or industries (Leckie & al., 1996; Liao & Hu, 2007). On the other hand, practical guides generally take the form of checklists, compiling questions to ask when evaluating a source of information. They aim to raise the attention of the evaluator to either the formal aspects or the content characteristics. These checklists are rarely used as such. They may, at first, guide and train to sources and information evaluations, then provide experience to the evaluator so as to work more efficiently.

By comparing both kinds of resources on the subject of information evaluation, it has been noticed that practical resources could be used as an acceptable summary. Therefore, two books have been chosen to broadly represent the usual criteria of information quality. In order to cope with the subject of this article, these criteria directly refer to online content and sources of the World Wide Web. Written in 1999 and 2001, the checklists were originally designed to help newcomers to assess sources on the Internet. The authors (Alexander & Tate, 1999 and Cooke, 2001) appear to have built their lists upon scholarly-valid research.

Moreover, when comparing themes to the lists of criteria proposed in theoretical articles all categories may be found in both or at least one of the chosen books. That leads us to consider them as an acceptable starting point to work on Information evaluation criteria.

4.1 Methodology

The theoretical analysis of this article consists in confronting a checklist as complete as possible to new types of sources in order to determine whether their importance has grown, decreased or remained equal. A global table was then built, compiling 8 criteria and 76 sub criteria. The criteria are generally found in academic literature and are purpose, coverage, authority, accuracy, accessibility, presentation and arrangement, and ease of use (Cooke, 2001). The author presented them in 2001 in the form of a checklist. Sub criteria, taking the form of precise questions, are listed to help information evaluator to determine the evaluation of criteria more efficiently. In doing so, she offered more operational material than the theoretical literature because of the exhaustiveness and precision of the checklist.

Each criterion has been confronted to new types of sources that have recently emerged and changed the informational landscape. As the article of Kolbitsch and Maurer (2006) offers acceptable validated background, its framework of technological systems will be reused to give a typology of « new types of sources » in our study, that is to say weblogs, wikis, podcasts, file sharing systems (e.g. you tube, flickr, slideshare, etc.) and social networks (e.g. Linked-in, Friendster, Ziki, del.icio.us, etc.).

The confrontation consisted in answering one question, for each 76 sub criteria: is this less (<), just as (=) or more (>) important when applied to these new types of sources than to the types that originally existed in 2001? In a synthetic table, the answers to that question were encoded with the following scale: -1 (less important), 0 (just as important) or 1 (more important). Afterwards, the scores were summed for all types of sources, on a scale ranging from “-5” to “+5” and sorted in decreasing order of value. In doing so, we tried to highlight the criteria which have become more important in today’s informational landscape. Finally, some charts were built upon transversal analysis of scores, average scores, and ranking. This aimed to support the overall reading and analysis of findings. According to this model, the more a format tends to “5” to more important the criterion has become. In addition, the more a format tends to a ranking of “-5”, the less important the criterion has become. Rankings close to “0” mean that the new format of “the criterion is about as important as it was originally”.

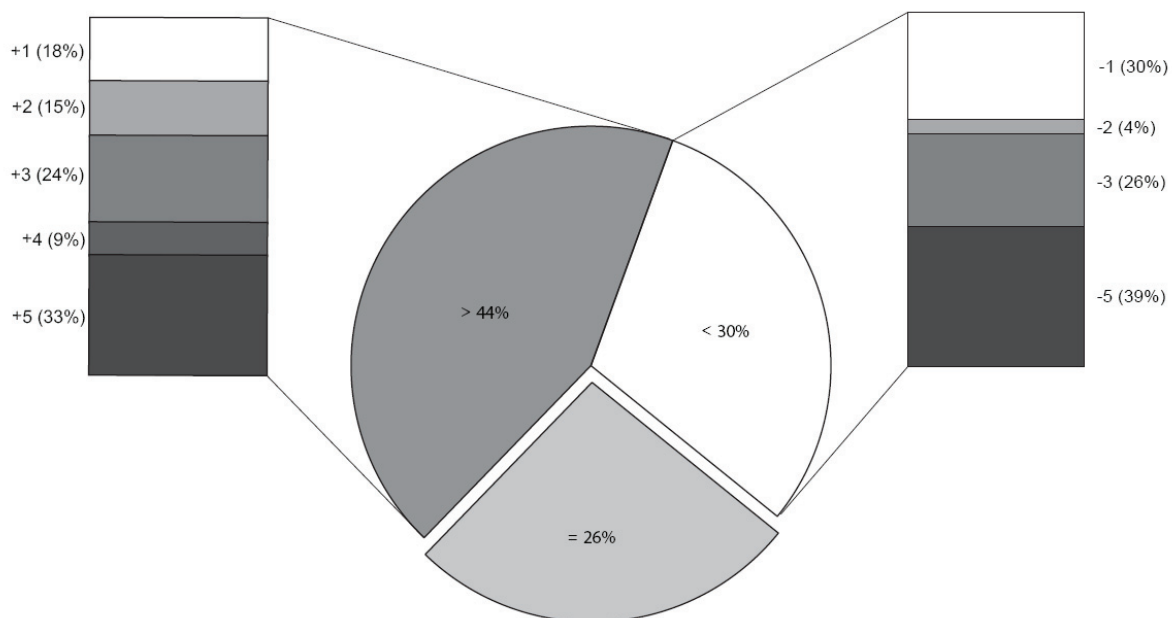
The scorings are based on our own judgement, regardless of any empirical validation. It is not meant to prove anything but, rather, to be thought-provoking. The theoretical approach chosen here is the first step of a broader research on Information Managers sources selection and information quality evaluation processes. To partly guide and support our rating of criteria, a checklist created specifically for Weblogs in the context of libraries was used (Clyde, 2004). Further details about it will be given later. It is our contention that findings deserve to be shared in the sense that they highlight important trends and guidelines useful for further investigations.

4.2 Results

Our analysis shows that new formats, inspired by Kolbitsch & Maurer, emphasize the importance of Cooke’s information assessment criteria: 44% of sub criteria (all types of sources included in a general pie chart, see fig.1) have grown in importance when applied to a new type of online source. 30% have lost in importance and 26% of the sub-criteria remain the same. Within the 44 % of growing importance criteria, a majority (33%) has the highest

ranking (5). Within the decreasing importance criteria, the majority (39%) has the highest ranking (-5). Even though, in both categories, the rates close to “0” still have a significant proportion (more than 30% when combining “1 and 2” and “-1, -2 ratings). This means that the overall growing importance suggested by the general pie chart at first (44%) has to be nuanced as many of criteria remain close to the importance they had in 2001. This suggests that new format of online sources will not necessarily create new kinds of highly important criteria. On the contrary, the criteria comprised in the decreasing part are more nuanced (30% for “-1” and 39% for “-5”), which means that those that decrease in importance are more likely to be neglected or avoided in the current processes. Another interesting observation may be found when considering the proportion of each ranking of criteria from 5 to -5. As expected, the majority of occurrence is held by the 0 ranking (26%). The ranking “5” is the most recurrent (14% of the criteria). An important finding, suggested by this general overview of rankings, is that there is a gap when analysing the results globally or precisely. This will be observed in the following analysis.

Fig. 1 : Occurrence of rates: global and detailed

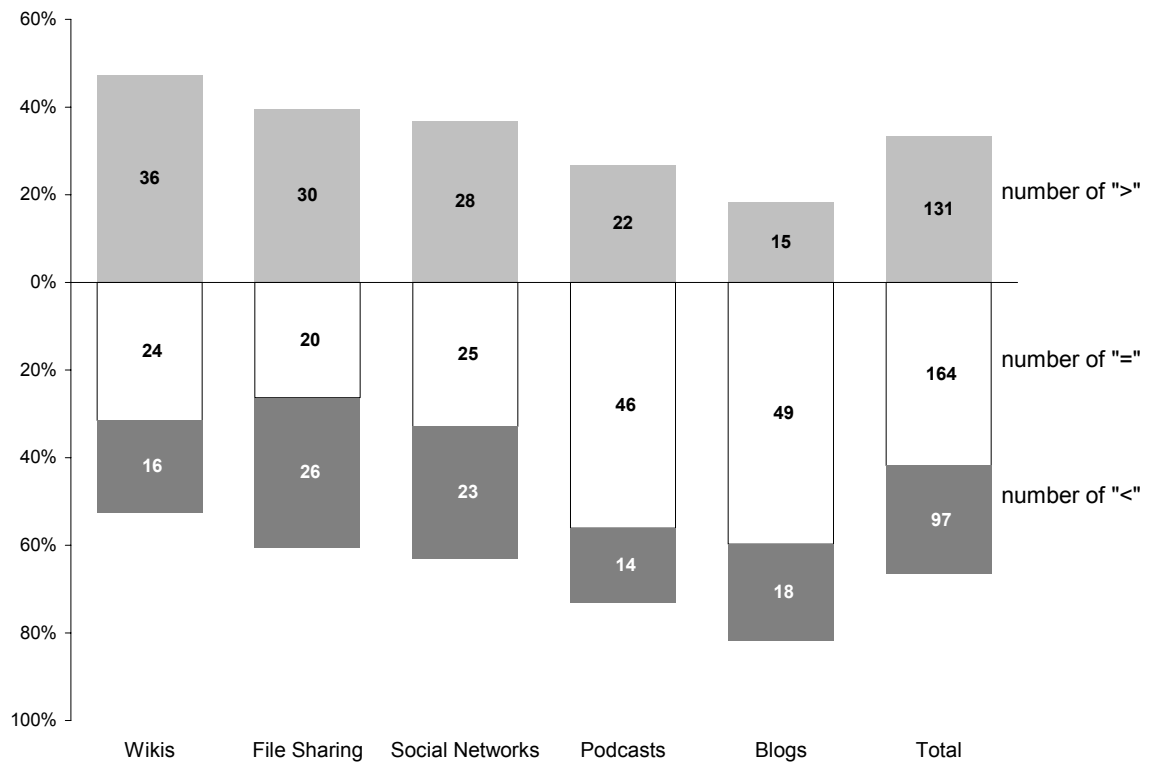


Several charts have been drawn in order to analyse the confrontation of criteria with each of Kolbitsch and Maurer’s specific new types of sources. The aim is to observe the proportion of the general scale (\geq , $=$, \leq) in each type of source. It is interesting to individually observe the new types of sources and to visualize the extent to which the format of sources impacts on usual criteria of information evaluation. Each format is analyzed here according to the answers given to 76 sub-criteria taken from the checklist used, which is then the total related to the results of occurrence of each scale. In this particular case, global criteria (see above) such as authority, coverage, accuracy, etc. are not taken into account.

The bar charts (see fig.2) shows that blogs and podcasts are formats which are characterized by the highest level of “=” (49 and 46/76). A second group is formed by wikis, file sharing and social network, which have a lowest rating of “=” (24, 20 and 25/76). Interestingly enough, this suggests that blogs and podcasts do not differ substantially from traditional sources on the Internet in spite of the huge amount of communication made on those formats as Internet “revolution drivers”. Typically, those formats may be compared to advanced

forms of self-publishing channels. In this case, the high level of “=” occurrence suggests that they are not the most challenging format for information managers. This observation will be nuanced when criteria are analysed more precisely below. The fact that the other group has a low level of “=” occurrence indicates that they are those which bring the highest degree of innovation and changes in information and sources assessment processes.

Fig. 2 : Occurrence of rates by format



The occurrence of “>” (more important) of those formats needs to be confronted, with wikis, file sharing and social network being the three highest-rated types of sources on that level of importance. Wikis have an occurrence of 36/76 and may be considered in our study as the most challenging format for information managers practices. The groups, suggested in the analysis of “=” level, are blurred when analyzed at the “>” level. If file-sharing and social network keep high scores of “>” (30 and 28/76), podcasts keep close with a rating of 22. Blogs confirm their position of less challenging format with a score of 15/76 “>” level. It has to be kept in mind that even though this score is the lowest, the comparison and ranking proposed here are relative. Indeed, the score of “15” means that 15 sub criteria have become more important when used to assess the quality of a blog format source, which does not mean that blogs *don't change the way information managers evaluate information sources*. This point will be discussed later in this paper. Coming back to the “>” results, it may be observed that podcasts have a higher score than blogs and that file-sharing and social network surpass podcasts. This trend may be explained by the extent to which a format differs from those for which the sub-criteria were designed originally. Wikis are an exception because they are a form of textual publishing. The way they are managed and produced plays the role of challenging factors. Podcasts (22/76 “>”) are still a form of content publishing but that content takes the form of sound or motion and is augmented by a RSS feed. That difference has an impact on some sub-criteria which gave podcasts a more relative challenging position, even if that format could be only seen roughly as an audio version of a weblog. Social

networks (with a score of 28/76 “>”) and file-sharing platforms (30/76 “>”) go further in the difference from traditional types of Internet sources of 2001. They are technically different from types such as newsgroups or mailing lists and generate contents different from blogs or podcasts. This could explain that more sub-criteria are “>” rated.

The occurrences of “<” tagged sub-criteria offers nuances to our analysis because they indicate a group of sub-criteria which have become less important when assessing new formats of sources. Two groups of format appear from that point of view. File-sharing (26/76) and social networks (23/76) are those which have the most rated relative “<” level. Blogs (18/76), Wikis (16/76) and Podcasts (14/76) have less occurrence of it. Again, it is a relative reading of results, which means that this group of formats still has less important sub-criteria. In the case of the first group, it must be noted that the “<” rated criteria are almost as high as the “>” rated ones. This seems to confirm the idea according to which the differences in technical and content aspects impact on the way information managers assess them (more or less important). Wikis, podcasts and weblogs have the same level of “<” ratings, but wikis and podcasts are characterized by a majority of “=” ratings, while wikis have a majority of “>” levels. This is why it is necessary to take all results into account at once. In doing so, it seems that our results suggest on the one hand a similarity between blogs and podcasts and between file sharing and social network platforms on the other hand. As shown in the bar charts, Wikis are unique and are the most challenging format for source assessment.

The 76 sub-criteria were originally designed by Cooke in order to guide the information evaluator through the assessment of more global criteria. As a reminder, they are authority and reputation, currency, coverage, accuracy, accessibility, presentation and arrangement, purpose and ease of use. Because it was not possible to directly rate each of those criteria, an average has been calculated on the basis of the ratings of sub-criteria relevant for each of them. This choice is consistent with the logic of the checklist, which is to use more operational sub-criteria allowing a global assessment afterwards. In doing so, the scale used to evaluate each criterion is then comprised between -1 and 1. The closer the average rating is to -1, the less important the criterion has become. And the closer the average rating is to 1, the more important the criterion has become. Ratings close to 0 indicate global status quo between former and new types of information sources.

In weblog format, criteria’s averages are all close to 0. Criteria that keep as much importance as earlier are authority and reputation, accuracy, ease of use, purpose and coverage. Presentation, accessibility and currency have averages below 0. According to the averages, accessibility and presentation are criteria which have lost most of their importance. Indeed, technical support of online contents has been dramatically improved by weblogs softwares. Content management systems such as these offer easy, almost free and fast means to publish content without requiring advanced technical skills (HTML, CSS, FTP, PHP, etc.). For instance, each blog post is automatically created along with a permanent link, a date and hour of publication, search facilities, etc. With traditional online sources, content creators had to personally take the initiative to add those elements on their web pages, which was then an indicator of seriousness, competence and trustworthiness. By the time all those elements are automatically created, these criteria have lost part of their relevance in assessing a weblog as a quality information source. Weblogs results show that the majority of “>” rated sub-criteria are related to reputation, experience, quality control processes, biases, available reviews, etc. This can be explained by the “smoothing effect” resulting from the use of average values. Weblogs remain a format which is the least challenging compared to the other types of sources studied here.

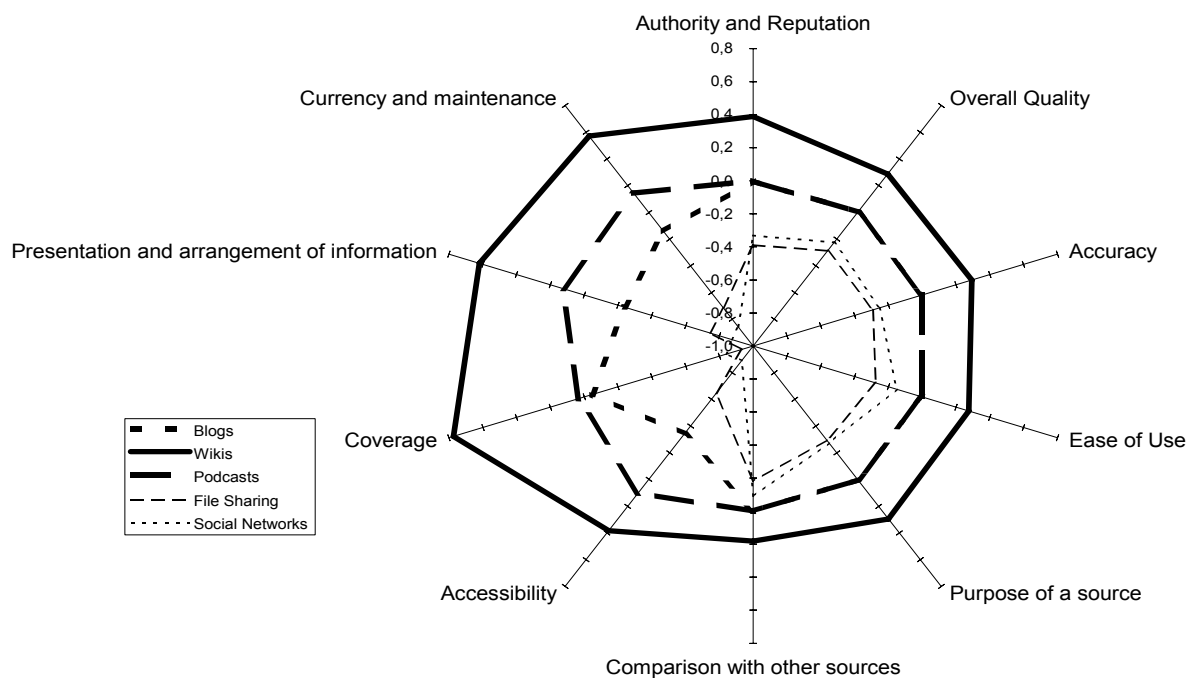
Podcast format has an almost identical range of results. No criterion has an average of less than 0. This may be explained by the highest occurrence of “>” rating noted earlier. It means that averages show no real increase in criteria importance. This has to be balanced by a closer look to sub-criteria. It appears that sub-criteria rated “>” are globally the same as weblog format but some of them are specific to podcasts. Those sub-criteria are mainly related to accessibility, coverage and presentation, reflecting the challenges of a new kind of content form.

Wiki format is different from all the other ones. All criteria are rated above 0. The highest scores are coverage (0.8), currency and presentation (0.6) and authority and reputation (0.4). It appears from those results that even if some sub-criteria could be “<” rated, most of them were “=” or “>”, which keeps the average above “0”. This confirms our previous analysis stating that wikis are the most challenging type of information sources.

File-sharing platforms and social networks have surprising average results. As shown on the bar charts of the absolute occurrence of ratings, they have the second and third highest rank of “>” rates. As it was added because they also have the highest rank of “=” and “>”, the averages dropped down to 0. This means that broadly speaking, their challenging property is not confirmed. Further details are then needed. Accessibility, coverage, presentation and currency have an average close to -1 (-0.9). Relatively, purpose, authority and ease of use keep such importance to assess the quality of information coming from such formats.

A combined view of different criteria is shown on the radar chart (see fig.3) featuring the average value for each criterion per format. The chart should be read as follows: the more displays in a circular shape, the more uniform the values for all criteria. Rough edges indicate various scores among criteria. The chart shows that the most uniform format, and then stable rankings, are wikis and podcasts. Weblogs follow the same line as podcasts for authority and reputation, accuracy, ease of use, coverage and purposes but differ from the accessibility, currency and presentation. Again, it seems that technical aspects of podcasts tend to increase the importance for those criteria. File-sharing and social network analysis takes benefits from that type of charts. Indeed, it highlights the great relative inequity of criteria’s averages. In this case, it shows that criteria such as currency, presentation, coverage and, to a certain extent, accessibility have lost most of their importance and relevance when assessing information generated by these types of information.

Fig. 3 : Averages of criteria by format



4.3 Further criteria

The criteria analyzed so far come from a checklist published in 2001, which was also an adaptation of an older list to the types of sources at the time. In creating it, Cooke took great care to understand the needs of the moment. A similar effort is needed today when we are trying to adapt the checklist to our situation. If any criteria increase in importance, many of them remain important and some decrease in importance. It may be expected that criteria or even sub-criteria should be added to cope with the new reality. Clyde (2004) proposed an interesting checklist, logically inspired by traditional ones but adding new criteria, coping with current formats and standards found on the Web.

Here again, the author lists criteria which are supported by more operational sub-criteria. Authority, purpose, coverage, reliability, currency, format, appearance, navigation, links, technical aspects, etc. may be found. We used Clyde's work to guide the rating of Cooke's checklist. If the global criteria differ in their wording, the content of sub-criteria covers Cooke's work. It becomes really helpful when accessing the last part of the list entitled "Criteria related specifically to blogs". Beyond sub-criteria related to technical aspects and look and feel, two things may be noticed and emphasized and enlarged to all new types of formats: interactivity and features. These criteria are really important and specific to new types of format. Even though Clyde only discusses blogs, these criteria are valid for all formats, i.e. podcasts, wikis, file-sharing platforms and social networks. Interactivity may be assessed on the basis of its availability but also its effective use (is the source full of comments?) and the content of the interactivity (relevant corrections, discussions, spamming, who posts comments? etc.) This is also very important in self-organized and maintained format such as wikis. Again, the more shared files are rated and commented by users, the more they become visible, which is the case in social networks (Guenter, 2005). Features consist in the availability, effectiveness and inter-operability of pieces of tools, links and extra-source communication. The presence of RSS feed has now become an important criterion for sources selection, especially on platforms of file-sharing, wikis, etc. Widgets (small computer programmes providing gadgets and accessories to the users) increase the

ability of people to consume information (information managers are concerned) and enhance content production capabilities. Therefore, these criteria cannot be ignored and need to be further investigated.

5. Conclusion

5.1 Discussion

Although our observations are not empirically validated, they point to findings which can help us understand the impact of new types of sources on information management. Sources and information evaluation processes are not dramatically changed by the shift towards Web 2.0 or whatever we call it. New types of sources force some evolution of the traditional criteria used by information evaluators. Generally speaking, checklists do not change a lot. They mostly need to be rethought and reorganized to better cope with the new reality of new types of sources. The awareness of that situation is the first step of the adaptation process, and a review of recent literature shows an increasing interest for that matter. The format of information sources presented by Kolbitsch and Maurer has acquired some critical mass in many fields and industries, which means that it is time to go a step further. Our paper is an attempt in that direction.

Our observations indicate that the sources selection and information quality evaluation process are not fully disturbed and drastically changed. There is not a sudden break between two “states of the information management art,” which is suggested by the fact that many criteria and sub-criteria do not increase nor decrease in importance, no matter what can be read in some “Web 2.0 emphatic literature”.

The detailed examination of the results shows that the more globally one looks at information criteria, the less one will notice changes. It means that there is no shift in terms of process but, rather, in the way it is concretely achieved. The blurring limit between information consumers and producers impacts the way information is assessed but not the fact that information has to be assessed. And when considering different types of formats, specific sub-criteria vary regarding technical aspect and effective use. If this statement is challenging for IM professionals, it is also encouraging to understand that the shift in the informational landscape, sometimes presented as a revolution, is not likely to upset their trade.

The most important factor impacting on evaluating sub-criteria is the technical characteristics of new formats. The ones that differ significantly from older types of sources on the Internet are those which seem to impact IM the most. In a sense, this may be confirmed and taken into account but has to be nuanced. The observation of the global table of sub-criteria ratings often shows that technical aspects lead to minimize or maximize the importance of most of the formats. What could be certain is that they are not neutral in the evolution of information assessment process. Yet it seems a bit reductive to think that technical aspects are the principal drivers of changes in the valuation process.

On the basis of our results, a relative ranking of challenging formats can be built. From the most to the least challenging formats, this study suggests the following order: wikis, social networks, file-sharing platforms, podcasts and finally weblogs. It is important to keep in mind that is still relative and that each format has sub-criteria which are “>” rated. Some sub-criteria have a “5” rate, which means that for each format, they have become more important. Among them, we can notice reputation and experience of the source, the existence or not of a quality-control process, the likely biases and motivations, user-friendliness, etc. This is noteworthy as that observation was blurred in the overall results. It emphasizes our awareness

that sub-criteria of checklists do not have the same weight among them even if results are calculated as if they are equal.

5.2 Future work

The purpose of this study was to draw attention to the fact that Information managers face challenges due to the transformation of their informational landscape. As this statement has been documented and sustained by a literature review, further investigation was undertaken to theoretically question the sources selection and the evaluation processes of Information Management. Our study aimed to offer a deep insight into the criteria which guide the evaluator to assess the quality of sources of information. If many observations have led to interesting findings, the method used needs to be empirically validated.

Firstly, it seems important to confront the theoretical findings of this paper to the ground of information managers. A first step will then consist in the creation of case studies to validate, improve and nuance our model on the professional field. This will also offer the opportunity to assess the weight of criteria and sub-criteria between them. As it was suggested in the discussion, the method used here does not reflect reality, e.g. sub-criteria as the existence of a quality control process is supposed in our study to have the same weight as the existence of a site map. This will need to be resolved to really cope with reality.

The second step will take Clyde's (2004) work further by questioning the specific sub-criteria that new formats involve. To follow in Cooke's steps (2001), it is time to take into account the new reality of the informational landscape in order to adapt practices. This study will require a detailed exploration of information managers' practices.

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Online Roleplaying Games As An Instrument For Humanitarian Researches And Experiments

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Abstract

Massive Multiplayer Online Roleplaying Games (MMORPG) are in the state of the rapid growth throughout the world. They attract millions of users. Some of the MMORPGs are reflecting the real world, including the realistic social and economy models, e.g. the Second Life (USA), the Territory (Russia). Those MMORPGs are already used by the real life companies in their business, in most cases for advertisement and marketing purposes.

In this paper the possibility to use those MMORPG universes for humanitarian experiments and researches is discussed. The possible courses and ways of such researches and experiments are briefly outlined, as their advantages and drawbacks. The conditions for using the MMORPGs in the humanitarian researches are described.

The paper's goal is to stimulate the discussion and, eventually, the development of the ways and means for virtual human-testing of social, politic, HR and PR technologies.

Massive Multiplayer Online Roleplaying Games (MMORPG) are one of the most aggressively developing business areas in the world. Latest hits in this area count many millions of users (or, more precisely, addicts).

The MMORPGs can be roughly divided into several categories, according to the nature of the game's universe and the gameplay:

- violence based: the single goal is to kill all the enemies (rescue hostages, save the World from aliens, and so on);
- strategy based: the goal is established by the setting of the game and may widely vary, the players have to conceive a plan, to gather artifacts and/or allies, and to choose their way through the game universe to their objective;
- experience based: the goal is to raise an experience and skills of the player's character as high as possible; the gameplay can vary from primitive one-to-one fighting of characters to a very complicated quest involving social activities (e.g., gathering and controlling a group of characters to make them to cooperate);
- society based: the goal is to build some quasy-life for the character, and to lead the character to some form of prosperity.

Many games, though, combine those principles and can not be associated with any single category for sure. Anyway many of them involve 1) some fighting and 2) some economy.

Although many of the MMORPG projects offer their users some escapist-oriented fantasy background, very distant from the real life, there exist some of them which, on the contrary, model a life very close to the common everyday life. One of the brightest examples of those is the famous Second Life. Russia also has such gaming universe named Territory.

Now some of MMORPGs gathered multimillion audience. For example, the World of Warcraft accounts for 8,5 million subscribers, the Second Life has now about 5.9 million "residents", and even the Territory has already attracted over two million users, a sheer

number for the country with as little as 26 Millions (22% of population) 6-months Internet audience.

So the games become places with high concentration of potential consumers or electorate. It is not strange that they are now regarded as a very attractive field for advertising, PR, political technologies, etc. For example, many companies already have invested in virtual offices and advertisements in the Second Life, expecting no less clients than they obtain from an office or an ad campaign in the first. Even in Russia, with the country's very short experience in modern marketing and advertisement, there are some good examples of product promotion via MMORPG (e.g., some years ago there was an agreement between the Izh automotive plant and the Territory, and then all the cars in the game were of the Izh model).

It is quite obvious that the MMORPG users, although they come into the game action to escape from the reality and to play someone other than themselves, in fact still are humans and act as humans. Their psychology, social behaviour and reactions do not differ from those of ordinary 'offline' people, at least from the people they are pretending to be in the game.

Having that in mind, MMORPGs are very interesting for humanitarian researches, modeling and experiments.

This idea is stated here to open the discussion on the possibilities, advantages and drawbacks of using the gaming universe populated with gaming people, as a means of simulating real life behaviour. It is very interesting to review the potential directions of such researches, their procedures and means, as well as conditions necessary for them, too. The idea is not based on any specific sociological or political theory, it concerns rather the methodology than the theoretical grounds. In principle, any of the theories can be (or be not) proved by those experimental researches.

The obvious advantages of this idea are:

- Cost: any action is in the digital form, influences all selected actors at a time, and their reactions are collected in the real time in the digital form too, via communication channels. No field researches, no hundreds of human researches going from door to door, no individual phone calls, etc.
- Very little latency from the impact to the response.
- Possibility to conduct even provocative or ethically questionable experiments without real damage.
- Precise recording of the response across all affected "population", not just a sample of it.
- Total tracking of all details of each experiment, even at the very low individual level.

The similarly obvious drawbacks are:

- Bias: the population of a MMORPG is usually very different from the population of a country in terms of sex, age, occupation, social status, psychology, etc. It is biased to younger males with much free time, with better than average computer knowledge and skills, and so on. From the psychological side they often tend to be introverts with escapist tendencies. So the researchers have to take into account that the sample will never be quite representative.
- The gaming universe is never as much complicated and multifaceted as the real world. Moreover, it is not quite realistic – or even not realistic at all. This, too, would require developing of some specific research procedures and methods.

(The above considerations were made on the base of an overall situation with the Internet audience and may require adjustment according to the goals and environment of each specific research.)

Nevertheless, there are areas where the results of a research or an experiment in the game can be used for conclusions valid for the real world. Here goes the list of some of those areas with some explanations.

1. Political PR. Finding and exploration of the new and advanced methods for influencing on the consciousness of masses. Finding and exploration of the methods to oppose it.
2. Corporate PR. Testing of new and advanced methods to improve a corporate image, direct testing of specific techniques or even documents formulae.
3. Marketing. Development and testing of new and advanced ways to promote products and services.
4. HR. New cost efficient methods for testing the personnel: for example, a potential employee is given an account in an appropriate MMORPG and a task where they can show their abilities and skills. This will work very well for managers that have to control and coordinate other people, for salespersons, for other employees that are supposed to contact people (clients managers, servicemen, etc.). The records of each step of the tested person is essential.
5. Psychology. Exploration of human behaviour in various conditions and situations applying similar setup to thousands of people and recording every subtle detail.
6. Sociology. Experimental research on, for example, processes of community building or roles distribution in workgroups, with unlimited ability to reproduce the input conditions and unprecedented level of documentation of the process.

There can obviously be invented many other fields where this methodology could work and give valuable results. In general, it brings precise instrumental modeling methods into human sciences.

The researchers that are going to use some gaming universe for their studies have to take into account the following.

The best conditions for such a research appear to be when the researcher has an agreement with the owner/operator of the game. In this way the researcher can have an access to the logs of the game, without which the main advantage of the methodology: precise documentation of the processes – will be lost.

In some circumstances there could be even reasonable to organize a special gaming environment dedicated to some kind of researches, e.g. in a university or a college.

There is a possibility to create an external logging system, but it is limited to the cases where examined people are the only objects to watch; it would not be possible to record events and conditions of the game in all their spectre.

It is clear that, as far as it is possible, the gamers should not be aware that their universe is used for the research, at least of its details, to avoid the influence to their behaviour.

Gathering statistical data or some other kinds of information from the game does not necessarily involve gathering the personal data of specific men and women, especially in the gaming environment where people usually take nicknames and do not use their real world data. In those cases where the personal data is essential for the research, the person(s) involved should be of course warned in a due course.

Conclusion

The idea to use the MMORPG universes for researches in human sciences is attractive because many advantages that it offers. This methodology can reduce costs and raise the efficiency of those researches. But to obtain relevant results the researchers have to consider the specifics of the MMORPG users community (for each concrete community they plan to use) and to adapt their methods accordingly. The very much desirable condition for such researches is an agreement with the owner or operator of the MMORPG.

Users In The 'Golden' Age Of The Information Society

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Abstract

In the Web 2.0 era it no longer holds to think of users as 'end-users', as they have moved to the heart of the value chain. They have become important actors in virtually all elements of online services. In this paper we shall explore these innovative roles of users and reflect on the future impacts of this shift. To support our claims about the innovative roles of users, we have analyzed 150 Web 2.0 services into more detail. In this paper we shall argue that Web 2.0 may be understood as a first sign of what Perez has labelled 'societal re-engineering' and 'creative destruction'. However, as we are still at the beginning of what Perez describes as a potential golden age of the information society, there are also still major uncertainties about the future of the web and the potential impacts this may have. At this point in time it is far from sure whether we are indeed approaching a 'golden age' of technological development. To explore the *future* roles of users, in the final part of the paper we shall therefore also highlight some future aspects from the perspective of changing user-producer relations.

1. Introduction

In 2004, O'Reilly Media popularized the phrase 'Web 2.0' for describing a new and potentially disruptive stage in the development of the Internet. The Web 2.0 concept has since become hugely popular - if not hyped - and has thus created as much confusion as consensus about what Web 2.0 really means. There has never been a coherent definition of the term; it has been more of a conceptual set of principles and practices (Madden and Fox, 2006). The concept originated from the observation that the Internet was far from dead after the burst of the dot.com bubble at the turn of the 21st century. Although the Internet crisis caused a substantial shakeout of Internet firms, it also marked a turning point for the web: since then we have seen a whole range of successful new applications coming up. Most remarkable and perhaps incomparable is the *exponential growth* of this new generation of applications, both in terms of number of applications and number of users. According to Gantz et al. (2007), in 2006 the amount of content created, captured and replicated on the Internet was about 3 million times larger than the information in all the books ever written. Their prognosis is that this will keep on growing the coming years. And by 2010, 70 percent of the content on the Internet will be created by individuals (Gantz et al., 2007: 2).

According to O'Reilly, behind the success of many Web 2.0 applications are smart ways of using the web as a platform for data management, particularly by exploiting the connectivity and collective intelligence of the *users*. Web 2.0 services exploit connections between users, as these connections provide manifold opportunities to create added value. Not only are users actively consuming content, users also take on distribution roles in peer-to-peer (P2P) file sharing, and content creation roles in the case of user-generated content. Users actively rate

and tag content (a phenomenon known as folksonomy), download content, comment on it, and communicate about it with their peers. Users furthermore share agendas, locations, bookmarks, documents, photos, videos and even friends, all online and on a large scale (Slot, 2007a). These user roles, combined with the scope and speed of the Internet, provide many opportunities for businesses to design new and innovative services. O'Reilly concludes about Web 2.0 services: "Network effects from user contributions are the key to market dominance in the Web 2.0 era"¹.

Thus, it is fair to state that one of the crucial features of this second stage of the web is the empowerment of the user. In the Web 2.0 era it no longer holds to conceive of users as 'end-users', as they have moved into the heart of the value chain. They have become important actors in virtually all elements of online services. In this paper we shall explore these innovative roles of users and reflect on the future impacts of this shift. This exercise will enhance the understanding of the concept of Web 2.0 and subsequently the roles users take on in this development.

1.1 Outline

First we shall describe in more detail how new user roles are represented in Web 2.0 developments. To support our claims about the innovative roles of users, we have analyzed 150 Web 2.0 services in more detail. We shall argue that Web 2.0 developments mark the beginning of what Carlota Perez has labelled the 'deployment period' of a technological innovation. This period is not only characterized by high deployment of a technology, but also by what Perez calls 'societal re-engineering' and 'creative destruction'. Technological revolutions involve complex processes of social assimilation, which encompass radical changes in traditional patterns of production, consumption, organization, management, communication, etcetera, leading ultimately to a different 'way of life' and possibly a 'golden age' (Perez, 2002: 153). We will explain what these concepts mean and they will be used as guiding principles in our analysis.

In this paper we shall argue that Web 2.0 may be understood as a first sign of societal re-engineering (represented by the shift towards user empowerment) and of creative destruction (represented by new business models underlying Web 2.0 services). However, as we are still at the beginning of what Perez sees as the second (and 'golden') period of technological development – the deployment period – there are also still major uncertainties about the future of the web and the potential impacts this may have. At this point in time it is far from sure whether we are indeed approaching a 'golden age' of technological development. To explore the *future* roles of users, in the final part of the paper we shall therefore also highlight some future aspects from the perspective of changing user-producer relations.

1.2 Methodology

In March 2007, 150 Web 2.0 services were analyzed. These services were selected from the Seth Godin *Web 2.0 Traffic Watch List*.² To construct this list, Godin employs the Alexa service. This online service measures Internet traffic by storing traffic data provided by users who have installed the Alexa toolbar. Godin uses this data to construct a Web 2.0 traffic watchlist, compiled of 952 services. These services are selected and ranked according to generated traffic. The list starts with well-known websites like YouTube, MySpace, Orkut

¹ <http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html?page=2>

² <http://www.statsaholic.com/sethgodin>

and Wikipedia, but also lists less famous services with interesting names like Drupal, Esnips, Meetup, Reddit, Feedblitz and Imeem.

The first 150 services on the list were selected for analysis. Upon closer examination, eleven services were not taken into account. Either they did not exist anymore, or they were not directed at private users but at businesses. The final case sample consisted of 139 Web 2.0 services. In the case sample, multiple variables were analyzed. These variables described mainly possible user roles in the services and the way these services generated an income. Although this research will be carried on in more depth in the future, in this paper we will present the first outcomes of the analysis.

2. User roles and socio-technical change

The now widely-used term Web 2.0 implies that users take on many active roles in the value creation process. They supposedly have become the key drivers of technological change. Many have embraced the idea of Web 2.0 – others have labelled the term a hype. If we use Carlota Perez' comparative analysis of technological transformations, we may consider the fast rise of Web 2.0 as the beginning of 'period 2.0' – or the deployment period of the Internet.

This point of view may be taken if we follow Perez' influential analysis in *'Technological Revolutions and Financial Capital. The Dynamics of Bubbles and Golden Ages'* (2002). In this book she argues that it takes several decades before the full fruits of a great technological revolution can be reaped. According to Perez each technological upsurge of the last centuries shows a similar pattern of subsequent stages of growth. First, there is a period of explosive growth, great turbulence and even frenzy, followed by a short period of crisis. In this first stage there is a mismatch between the belief in the promises of the new technology on the one hand (expressed in high investments of venture capital) and the socio-economic environment on the other hand, which is still dominated by 'old' institutions. The first 'installation period' therefore often ends in a crisis, or burst of the 'bubble', as we have seen with the dot.com crisis at the beginning of the twenty-first century. After this crisis follows a period of more harmonious and sustainable growth, characterised by high deployment and a better fit between the 'new' technology and the socio-economic context in which it is deployed and embedded. High deployment creates the conditions for 'a real golden age of a technological revolution'.

Perez' analysis is particularly useful for an analysis of the development of the Internet: in her terms we are now at the threshold of the second stage of this particular technological revolution. Characteristic for this stage is not only the high degree of deployment of technology, but also what she calls 'creative institutional destruction' and 'societal re-engineering', which are the necessary conditions for this more stable and harmonious stage of technological development. We have used Perez' thinking here in a rather broad sense for our assessment of Web 2.0 developments. In the following account of our analysis of 150 web services, we will focus on (1) the deployment of Web 2.0 services, (2) 'Societal re-engineering' and (3) 'Creative destruction'.

The concept of deployment is used to describe to what extent and in what way Web 2.0 services are deployed (or used). Firstly, to assess the level of deployment of Web 2.0 services, we need to have indications about the extent of use of these services. A first indication can be found more generally in other research about the uptake and impact of

Internet technology. Specifically for our case sample we have taken into account figures about the use of these services. Even though it is difficult to obtain reliable figures which indicate use (often these are measured in many different ways) we will attempt to shed some light on that issue. Another indication can be found in the data from Alexa providing Internet traffic figures. Secondly we need to assess the nature of these Web 2.0 services. Based on an analysis of our case sample we made a classification of Web 2.0 services.

Societal re-engineering is represented in our analysis by new or innovative user roles. These roles reflect the potential of the technology to adapt to and be embedded in real societal needs. This study focuses on users at home who are active on the Internet in their leisure time. User roles do not need to be completely ‘new’ in the sense that they have never been taken up by users before. Users for example still are *consuming* content online in more or less conventional ways. Following Tuomi, innovation can also be understood as a process where user communities “develop new uses for existing technological artifacts, at the same time changing both characteristics of these technologies and their own practices” (Tuomi 2002, p.23). Compared to the roles users had in relation to more traditional media like newspapers and television - mainly as consumers and interpreters of content - the roles that users have taken up when using internet, have certainly changed significantly. As has been clarified in our introduction, users have become co-producers of virtually all elements of the service delivered, creating value in many stages of the value creation process. They are taking up roles that previously had been taken up primarily by business parties. And even the traditional roles, like consuming content, are now much more diverse in nature.

To explore these new roles more closely, for this study we have defined five categories of user roles based on observational data; consuming, creating, sharing, facilitating and communicating. These categories are subdivided into more diversified roles, see Table 1.

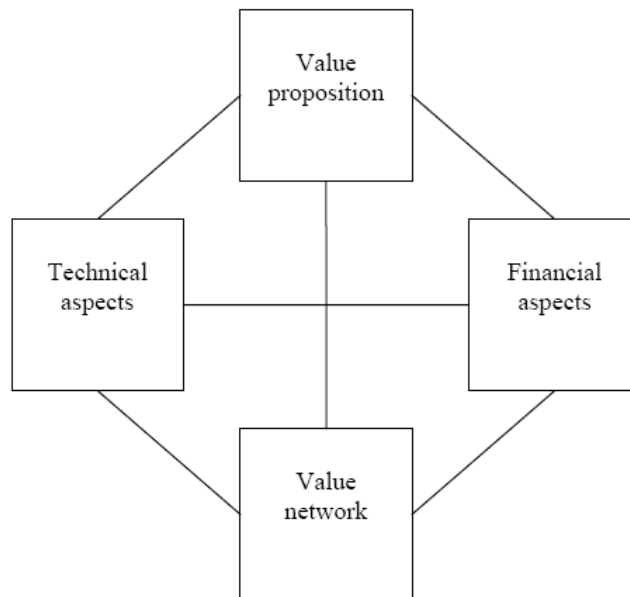
Table 1: Role classification

General role category	Sub-role
Consume	Read
	View
	Listen
	Download
	Buy
	Play (game)
Create	Search
	Customize/ personalize
	Create/ produce content
Share	Contribute
	Publish
	Upload
Facilitate	Send to others
	Tag
	Recommend
	Filter
Communicate	Subscribe (RSS)
	Channel
	Send message to other user
	Comment
	Rate
	Chat

Creative destruction is represented in our analysis by new business models underlying these services. When traditional ways of doing business are being replaced by new and innovative ones, it can be argued that significant changes are taking place. With the concept of ‘businesses’ (or producers) we want to indicate the parties that are most directly connected to

the users as the producers/facilitators of the services. In our analysis, the concept of a business model does not only comprise the revenue model of a service, but also the way the service is technologically defined (is it open or closed), the way businesses are taking up their position within the field (are they cooperating with others for example) and the value they offer to their users (e.g. Timmer, 1998; Osterwalder, 2004). These four business model domains will be used as informal guiding principles in our analysis. For a graphical representation; see Figure 1. We will use these general business model levels as exploratory, heuristic concepts.

Figure 1 General business model levels



3. The deployment of Web 2.0 services

To what extent are Web 2.0 services used? As has been described in the introduction, Gantz et al. stated in a white paper that already in 2006, more information was available on the Internet than in all the books in the world. This indicates that the Internet has become a huge database of information. However, it doesn't give any hints about to what extent this technology and this information is actually used. Many research institutions, for example the Social and Cultural Planning Agency (SCP) in the Netherlands and Pew Internet and American Life Project in the United States are researching the uptake and use of the Internet. All research results show a drastic growth of Internet use the past few years. In the Netherlands, the SCP has investigated that almost 80 percent of the population now has access to the Internet, compared to 28 percent in 1998 and 74 percent in 2004 (SCP, 2004). For example Pew shows that in the United States, between 2001 and 2005, the number of American adults that used the Internet to develop or display photos rose from 23 million to 49 million (respectively 20 percent and 34 percent of the Internet population these years) (Madden & Fox, 2007: 3). And the market share of an application like Wikipedia has risen from 3 percent in august 2005 to 21 percent one year later.

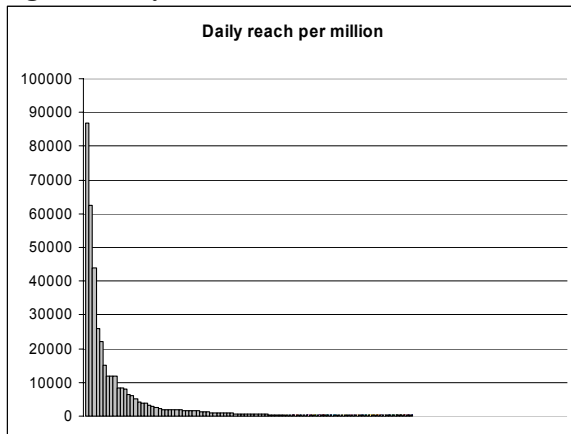
These data are very convincing and do provide a strong indication that the uptake of Web 2.0 services is really taking off. However, little efforts have been made to systematically assess the impact of the Internet and Web 2.0 services in all its depth. Pascu et al. (2007) have

started to provide insights in this area. They made an assessment of the development of new Internet technologies. Their study primarily investigated the socio-economic impact of these new Internet technologies. Pascu et al. state that the past three years have clearly shown a ‘dramatic growth in take-up’ of Internet technologies. To underline their arguments, Pascu et al. use both formal and informal sources; for example the rise of the number of blog entries, revenue of services like eBay, the rising number of authors providing content on Wikipedia and the number of broadband subscribers. Overall, first results of research being done in this field show that Web 2.0 services are being deployed on a large scale.

3.2 The uptake of Web 2.0 services

Looking in more detail at our case sample of 139 Web 2.0 services, we can try to be more specific. How often are these services used or visited? Accurate information about number of visitors or users is hard to obtain. Some services indicate the number of members or visitors themselves, but it needs to be underlined that the way these figures are measured is often obscure. Use figures provided by the services themselves differ from 30 billion page views a month (Facebook) to 100 million visitors a month (eBay), to 200 (9rules). These figures do not provide any reliable information about the uptake of the Web 2.0 services in our sample. We can also look at the number of members the services have. A quarter of all services give an indication of the number of registered users/ members. This figure differs from 100 million members in the case of for example MySpace and Skype, until 30.000 members in the case of Ning (a website where users can create their own communities). On average, the services have almost 12 million members each. Because of the large differences between services, a more accurate measure may be the median, which is 2 million.

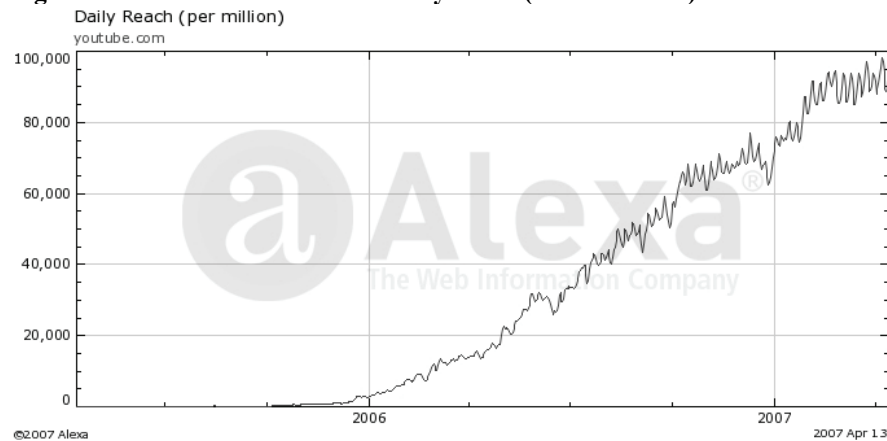
Figure 2 Daily reach of Web 2.0 services in case sample



A more structured indication of web traffic is provided by Alexa. This service (used by Godin to construct his Web 2.0 Traffic Watch list) gives an indication of web traffic per day. It measures how many of 1 million users visit the service on an arbitrary day (daily reach per million). The traffic generated by the Web 2.0 services in the sample varies from 87.000 for a service like YouTube until 25 for B2evolution – a free blogging tool (see for an overview of all services

Figure 2). Considering that there are more than 1 billion internet users, even 25 still is a large number of people. The average traffic for the services in the sample is almost 3000, but also here; the median is much lower and accounts for 280. To illustrate the fast rise of Web 2.0 services, Figure 3 shows the rapid uptake of YouTube since 2005.

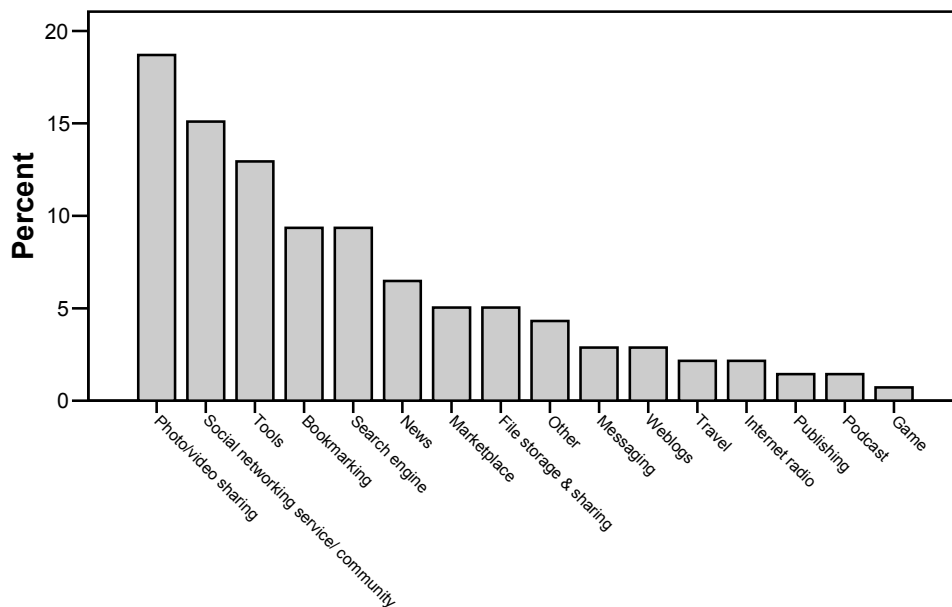
Figure 3 Overview of YouTube's daily reach (source: Alexa)



Comparing these services with Web 1.0 services – cnn.com has a traffic figure of 11.000, the website of the British Encyclopaedia Britannica has a traffic figure of 350, while Wikipedia counts 62.500. The Washington Post is measured for a daily reach of 2200, which is as much as the daily reach of Bloglines – a news feed aggregator. Kodak gallery has a daily reach of 600 – compared to the traffic generated by Flickr: 12.000. Looking at these figures, it can be stated that Web 2.0 services are generating a lot of traffic, often even more than Web 1.0 services do.

3.3 The nature of Web 2.0 services

Table 2 Classification of Web 2.0 services (N=139)



Besides estimating the uptake of these Web 2.0 services, it is also of importance to indicate the nature of the services we have been studying. **Error! Reference source not found.**

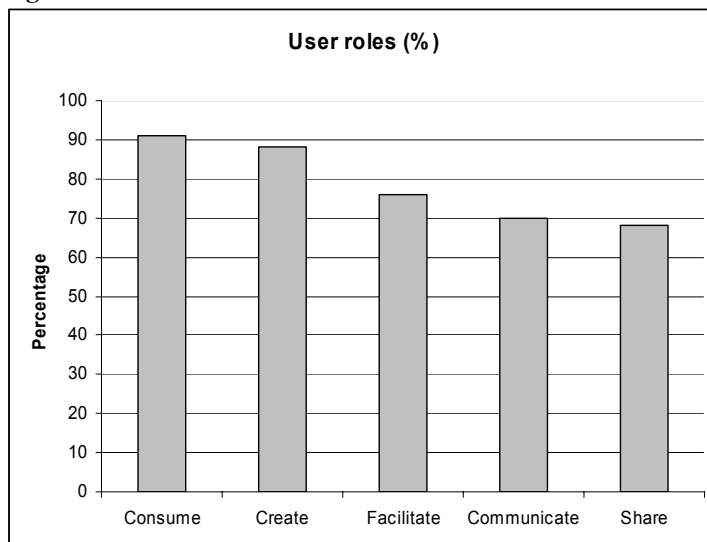
presents a classification of the Web 2.0 services in our case sample. Most services provide users with the opportunity to store and share content like photos and videos. These websites are primarily directed at user-generated content. Social networking and community websites are also clearly present in the Web 2.0 domain. Besides MySpace, Orkut and Friendster, many other social networking services have come into being. For example Meetup, which provides people with the same interest a platform to find like-minded individuals in their neighbourhood. They meet up in real life. The service intends to vitalize local community. Other communities have different goals, but they all focus on connecting people with similar interests. Also the services that provide user tools are often focussed on social aspects. Ning is a tool that lets users create their own social networks. Users can make easy personal pages with Peanutbutter, personalize their start page with Netvibes or Pageflakes and collaborate with others through the Basecamp tool.

3.4 Summarizing

To sum up, looking at various research outcomes, most evidence underlines that the new generation of web services in general are taken up very rapidly. There has been an exponential growth of the uptake and use of services with Web 2.0 characteristics. Specifically services that focus on sharing and storing content (like YouTube and Flickr) and social networking communities (like MySpace, Orkut and Friendster) are very popular among users. Sharing, finding, saving, connecting and communicating seem to be the key aspects of the services in our case sample.

4. Societal re-engineering

Figure 4 Classification of user roles in Web 2.0 services



In the introduction to this paper, we have stated that active users are the linchpin of Web 2.0 services, as they thrive on active interactions between and connectivity of users. To support and refine this statement, we analyzed this ‘user activity’ by focusing on the kind of roles users were allowed to play. The roles were categorized as consuming roles, creating roles, sharing roles, facilitating roles and communicating roles. Figure 4 shows the classification of user roles in the Web 2.0 services of the case sample. All user roles are frequently enabled by the services – which indeed indicates strong user activity.

Looking at 139 services, it becomes clear that these roles are rather diversified. For example consumption not only consists of reading, viewing and listening. Users are also enabled to search, download, buy or play. Below, per user role the outcomes of the analysis will be discussed. We shall pay attention to the way these roles are divided into sub-roles and what users do most.

4.1 Consuming

Consuming content is the most passive role for users, for it is the stage in the value chain where the value of a certain product is transferred to the user. This is the case when a user buys a product, or uses a product, for example by reading or viewing content. If websites offered the user the opportunity to find and consume the content, this was labelled consumption. Consuming still is the main activity of users online; 91 percent of the Web 2.0 services offer some kind of content to be consumed. Many services, 78 percent, also allow users to search their website or database. Some services fully focus on searching functionalities, for example personalized search engines. Finding things online is very important. 66 percent of all services offer their users material to view audiovisual content on their website – for example photos or video. In 31 percent of all cases – videos are directly streamed on the websites. Only in 19 percent of all cases, users can download movies. 32 percent of all services in the case sample were offering their users reading material – for example news messages or weblogs online. In 16 percent of all services, users were offered to buy things online. 14 percent of the services provided audio content and only 4 percent let the users play a game.

4.2 Creating

Opposed to traditional web services, users are more and more offered the opportunity to create their own content. In 88 percent of all cases users were in one way or another creating their own content. But content creation can be measured at different levels. In 43 percent of all services, users can create and upload their own content – for example movie clips or photos. Users also often are enabled to write their own weblog. Customization is a different form of user generated content. This is a more limited form of content creation, because users are only allowed to *adapt* a service, existing content or products as they please. This adaptation is only allowed to take place within given limits, pre-ordered by the service. In 35 percent of the services, users were enabled to customize something in the services. Often, users are allowed to customize their own personal profile – change colours, add pictures etcetera. One quarter of all services allows users to contribute. They can add something to a website – for example a review or their own story.

4.3 Sharing

Web 2.0 services also enable users to share content and thoughts on a large scale. 68 percent of the services have a sharing functionality. Half of all services allow users to publish their own work – audio, video or text. Users can upload their work on these services in 47 percent of all cases. Almost one third of all services allow users to send their content or a link to their content directly. However, there are only a few services that use a P2P network to allow users to share content. This indicates that these services are only semi-open. They enable users to take on many different roles, but the way the services are operated do not change the hierarchical organisation of the service.

percent of all services, users can give ratings; they can judge content – and even other users. Direct chatting is not as popular. Only 15 services, 11 percent, offer users the possibility to directly chat with one another.

4.6 Summarizing

Societal re-engineering is indicated by the shift from top down to bottom-up dynamics, characterized by new user roles in Web 2.0 services. Traditionally, users were mainly consumers of content. But on the Internet, they are enabled to take on many different roles – which they have done on a large scale and which in turn has influenced the innovation dynamics underlying the rise of the new generation of web services. These user roles have been illustrated above. Users have started creating content on a large scale. They share this content and thoughts with each other through the Internet. Furthermore, hierarchically defined taxonomies are more and more supplemented and possibly replaced by folksonomies based on collective intelligence.

These developments are in line with various researchers that have pointed out that users are increasingly important. Toffler (1980) already indicated that users were increasingly combining their consuming role with producing tasks, for which he has introduced the famous phrase “prosumers”. Some years later, Leadbeater (2004) coined the term pro-ams, referring to amateur users who were more and more professionalizing their activities. According to Leadbeater, innovations were often not diffused through a pipeline, but initiated more bottom-up (swarms of innovation). Furthermore, Von Hippel (2005) has written extensively about the impact of users (lead users) on the innovation process in his book *Democratizing Innovation*.

5. Creative institutional destruction

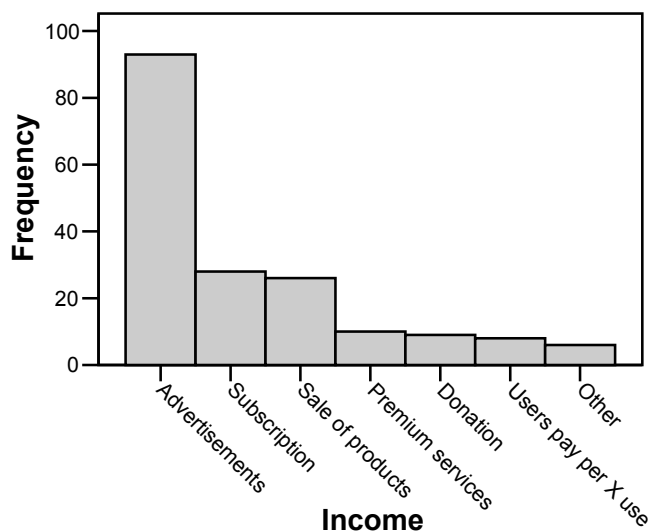
According to Perez, the ‘golden age’ of a new technology is also characterised by creative institutional destruction. One hint that things are changing are the rise of innovative user roles as explained above. But it takes more for a society to develop in ‘newly engineered’ ways. Do new and innovative user roles make a difference or are they merely incorporated into more traditional ways of organizing business as usual? A sign of creative destruction may be that new business models are beginning to develop, expressing shifts in ‘patterns of production, consumption, organization, management etcetera’ (Perez, 2002:153). Therefore, in our analysis we have made an attempt to unravel some of the features of the underlying business models for Web 2.0 services.

We will discuss two important basic features of this conceptual model. Firstly, the revenue models of Web 2.0 services will pass in review. Changing revenue models are an important indicator of the destruction of old business models. But as we have explained, a business model is more than only a revenue model. We use a conceptual framework building on four layers that all add something to the companies’ value offering, as is shown in Figure 1. Therefore, next to the revenue model, we will also pay attention to technological aspects of the Web 2.0 services – more concrete – the openness of these services for change. The value proposition of the services has already been subject of this paper in the above section about societal re-engineering. Therefore this part of the business model will be taken together with the value network concept. These two concepts will be illustrated by an example.

5.1 Revenue models

More than half of the services (67 percent) make money by placing advertisements on their websites (see Figure 6). Most services use Google AdSense, which arranges for the advertisements to be adapted to the content of the service. This is basically no different revenue model than more traditional forms of media have. But there are also other and often complementary revenue streams for Web 2.0 services. 20 percent of the services in the case sample had some sort of subscription service. Users were offered extra functionalities or for example extra storage capacity for a monthly fee. Other services (19 percent) offer their users actual products on their website. A smaller selection of services (7 percent) use premium services, add-on services users have to pay for, or charge users per X use (6 percent). Most websites that are offered by individuals or are part of open source projects ask their users for voluntarily donations; these websites often do not contain any advertisements and count for 7 percent of all services in the sample.

Figure 6 Revenue of Web 2.0 services



From the case analysis, one striking characteristic is that 17 percent of all services share income with their users. This is a much larger percentage than we had anticipated before the analysis. And it is a very interesting new aspect of Web 2.0 services. In what ways do services share revenues with their users? Services that share revenues most often are photo and video sharing websites (35 percent), news services (17 percent), social communities (17 percent) and marketplace websites (13 percent). In most of the cases, services share their advertising revenue with their users. This is not surprising – considering this is the main source of income for most Web 2.0 services. But there are also other possibilities.

There are several services, for example iStockphoto, or Fotolia that allow users to display their own photos as ‘royalty free’ images. Other users or business parties can buy these photographs at different prices and the user will receive an incentive per photo sold. AssociatedContent, a news website, screens all content that has been send in by its users. They will buy content they find interesting enough to attract other users. The service itself makes money out of the advertisements shown on the website. Another news website,

Nowpublic, enables users to write their own news stories online. They do not apply a strict selection. Other users who find the stories of one particular user interesting, can make a voluntarily donation. Squidoo, a bookmarking and recommendation site, not only shares advertisement revenues, but also affiliate revenues when a user recommends a product from a commerce partner (for example Amazon or eBay). At IMVU, a 3D chat application, users can earn money by making content (for example objects or environments) when they have obtained a pro developer status. Sometimes, the revenue share grows when a user has build a solid reputation online.

How popular are these services among users? According to the Alexa service, these services on average generate traffic measured at 605 per day. This is below average, but the median is 400, which is above the general case sample median. Subsequently other services (for example YouTube) that have not yet taken this step of letting users share in revenues are exploring this option as well.

5.2 Open or closed technology

Most services are relatively open. Almost all services, 94 percent, offer their basic functionalities free of charge. They are very accessible and often have a user-friendly interface. The services are mainly web-based – 85 percent of all services can be used without installing software. This lowers the threshold for participation.

But it needs to be underlined that services are not completely open. Users do need to log-in to make use of the main functionalities. Technology is often deployed to enable users to navigate easily the website functionalities. As has been shown in the previous section of this paper, users are relatively free in Web 2.0 services to create content themselves, add things and personalize the services they use. The analysis of the case sample also shows that many services offer users the possibility to combine different services. I can for example upload my Flickr photos on my social community network, or automatically bookmark certain services on my del.icio.us account. These characteristics imply that most Web 2.0 services truly use technology in an open way.

But looking more closely, this statement deserves some modification. If services would be truly open, users would also be enabled to tinker with the technological framework of the service, as is the case with open software projects. Or users would be enabled to control the data sharing themselves, as is the case in P2P file sharing networks. Our analysis shows that only 7 percent of the Web 2.0 services is actually based on open source software. Furthermore, only 1 percent uses P2P technology for file exchange. Nonetheless, if you compare these Web 2.0 services with ‘Web 1.0 services’, users do have many more opportunities to interact than before. Therefore, the way businesses position themselves on the Internet can be classified as semi-open.

5.3 Value network and value proposition

Many services strongly rely upon their users for value. Therefore, attracting enough users is extremely important. A social networking site without users can not provide a lot of value. A video website without users uploading videos is of no use either. How do businesses optimally exploit connectivity and the new user roles that have been explained earlier in this paper? As has become clear looking at the technical specificities, services provide users a low threshold for participating. They often do not have to pay for basic functionalities and the

services can be used from any location without users need to download software. Services also often position themselves as cooperating with other services. At least one third of the services in the Web 2.0 case sample were explicitly offering functionalities linked to other services. Many weblog and social community services enable users to incorporate their Flickr photos or YouTube movies directly into their account. Photos can be placed on location maps (“Google mashups”) or websites can be automatically added to bookmarking accounts. These features enhance the value for users.

The more users participate in these services, the higher the network effects are. One example of a service that heavily relies on these network effects is Couchsurfing (couchsurfing.com). This hospitality service connects users that are travelling abroad in real life. The service provides travel information and offers users contact addresses in the countries they are going to visit. This service makes travel agencies and even hotels obsolete. Users offer each other a place to stay. To provide an extra safety measure, the site uses an extensive status system (vouching and verification) to make as sure as possible that the users are reliable.

Another example of a service that tries to maximalize user value is iStockphoto. As has been described, many services try to keep the threshold for participating as low as possible. They try to obtain as much users as possible. But iStockphoto employs a different strategy. Every user that wants to upload photos to their website is screened. The quality of the photos must match certain pre-defined criteria. If users are allowed to participate, they may upload photos and share revenue with the service when their photos are sold. By being selective, iStockphoto tries to improve its value for others.

5.4 Summarizing

Summarizing, changing revenue models of Web 2.0 service point to some first signs of creative institutional destruction. Users are increasingly incorporated into the revenue model of services. Not only as paying actors, but also sharing revenue with business parties. Looking at other elements of the business model of Web 2.0 services like the value proposition and the way services are cooperating, it becomes clear that services are creatively employing their users’ activities. Many websites of more traditional media services like newspapers and television stations are also increasingly incorporating Web 2.0 characteristics into their services. On the BBC website for example, users are invited to send in their own photos or comment on news messages. Most Web 2.0 services try to be as open as possible to attract many users and optimally create value. On the other hand, figures about open source projects and P2P file sharing indicate that truly open in technological sense are only a few. We may therefore conclude that up until now, only ‘relative’ creative destruction can be discerned.

6. Future directions

As has been outlined in the previous section of this paper, Internet characteristics, combined with user activities push, and at the same time enable companies to reorganize their businesses. Business models are changing. New parties enter the field. Businesses have also started to incorporate user roles into their business models. But the developments still raise many questions. One of the uncertainties coupled with user roles, concerns the further development of the Internet – will it remain a relatively open environment where users can freely move around, or will it develop into a more closed environment. A second uncertainty concerns the way revenue models are going to develop. Will services remain free of charge or

will users increasingly need to pay for online services and content when these services have become a natural part of everyday life? Will the characteristic of users sharing in the revenue of the services further develop? How will services organize their business in the future, and what consequences will this have for user roles? These uncertainties can be further analyzed by conducting a scenario exercise.

Figure 7 Scenario quadrants (Source: Slot, 2007b: V)



In the context of the B@Home project (a Dutch research project focusing on the future of broadband multimedia services in the home), a scenario exercise was conducted that analyzed these uncertainties (Slot, 2007b). Four scenarios were constructed for 2015 along two axes: free content/ services for users versus users pay for content/ services, and an open and free online environment versus a closed and protected online environment.

Looking at the axes, four scenarios are defined (see Figure 7). Scenario one is called *Grassroots Hobbyists*. This scenario (free content/ services in an open and free environment) is characterized by bottom-up developments. Users are active participants, creators, producers and distributors. Firms have no clear revenue models. Because users have taken the lead, they play a small part in the innovation process. Scenario two, *Marketplace M@rvels*, (users pay for content/services in an open and free environment) has the same characteristic as scenario one, considering the open and free online environment. But in contrast to scenario one, where business parties were not making any money, new revenue models have been developed that allow content and service providers (sometimes also users themselves) to earn money. The third scenario is called *Webworld Billboards*. In this scenario (free content/ services for users in a closed and protected environment) user communities are exploited as marketing machines. Users act as gatekeepers and rate and tag content. Innovation is a continuous process and businesses act as facilitators and content providers. In *Bandits & Cashcows*, the last scenario (users pay for content in a closed and protected environment) the main characteristic is the utilization of strict copyright protection. Businesses are very scared of copyright infringement, and users fear for their privacy. Users and businesses are strictly separated and innovation is hampered by harsh copyright protection.

We will not discuss these scenarios in great detail in this paper.³ But it might be interesting to highlight some of the main issues presented in the scenarios.

6.1 Main scenario issues

The four scenarios enable different user roles. In two scenarios, the online environment remains relatively open. The Grassroots Hobbyists scenario as well as the Marketplace M@rvels scenario enables users to take on many active roles. In the latter scenario, users even earn money with their activities on a large scale. If the Internet develops into a more closed and controlled online environment, user roles will be much more constrained. The Webworld Billboards scenario still permits users a limited form of freedom. They can still be active in online communities (this is also stimulated by businesses), and can also actively share things with each other. But still, Internet has changed. Users have to register more extensively and user identity is coupled to mobile phones. Content can only be shared in streaming format. Most limitations are present in the Bandits & Cashcows scenario.

The level of openness not only influences the way users can behave, but also the possible interaction between users and businesses. The more freedom for the users, the more two-way interaction will develop in the future. In the Grassroots Hobbyists scenario, the users enjoy great freedom. They can take on many roles and can use services and content for free. In this scenario, the roles for traditional business parties are declining. Businesses will have great difficulty developing viable business models. Users will not represent monetary value for businesses online – they will primarily take the users as a source for the offline product development.

On the other side of the spectrum, in the Bandits & Cashcows scenario, we see a different development. The more closed the network and the more often users have to pay for online content and services, the more limited user roles become. Internet is characterized by one-way traffic. Large multimedia corporations will create walled gardens. Users are seen mainly as consumers. They only have access to controlled and approved websites. Users are severely restricted in putting content online themselves. They need to go through an authentication process before they can enter the Internet. This is more of a top-down model.

Scenarios two and three steer a middle course. The dynamics between users and business are characterized by top-down as well as bottom-up interaction. Users need businesses for their experiences and facilities like servers. Businesses are providing the outlines and edit content to make it more attractive for the users. They facilitate users technically and editorially. Because the threshold between users and businesses is extremely low, they can constantly interact to improve the services they offer. Businesses need users for their input, user base and information. The market has splintered into thousands of niches, and companies need users to make sense of this. Because many similar services are online, competition is fierce. Internet is an open environment and users demand the right to use their content in many different ways and access their content on different platforms.

Thus, even if Perez' model of deployment is applicable to the Internet development, the way this uptake is going to take shape in the coming years, depends on many decisions. We should be aware that decisions about the character of the network are affecting user roles and the interaction between users and businesses. There still are a lot of uncertainties in the online

³ For more information about this project, visit <http://www.userproducer.nl/future-users.html>

domain. These uncertainties are not going to be solved here. But it needs to be underlined that ongoing research about the online developments and the roles of users is crucial in understanding ongoing developments.

7. Concluding

We have started this paper by stating that users were crucial for the development of the 'golden age' of the information society. Taking Perez' concepts that mark a period of more stable growth, we have first analyzed the deployment of Web 2.0 services. Various researchers have shown that the Internet in general is taken up very rapidly and on a large scale. There has been an exponential growth of the uptake and use of services with Web 2.0 characteristics. Our analysis has shown that particularly services that focus on sharing and storing content (like YouTube and Flickr) and social networking and communities (Like MySpace, Orkut and Friendster) are very popular among users. Sharing, finding, saving, connecting and communicating seem to be very important aspects of the services in our case sample. Thus it is fair to conclude that the stage at which we are now, can indeed be described as a phase of high (and still growing) deployment. However, there are more characteristics that should be taken into account.

According to Perez, a key characteristic of the deployment period is societal re-engineering. To make an assessment of this concept, we analyzed new or innovative user roles. We have shown that Web 2.0 services enable users to take on many different roles, which reflects the active involvement of users in the appropriation process of these services. Traditionally, these were often reserved for business parties. Users have started creating content on a large scale. They share this content and thoughts with each other through the Internet. Furthermore, hierarchically defined taxonomies are more and more replaced by folksonomies based on collective intelligence. The empowerment of the user is an indicator for this process of social assimilation.

A third concept we have studied to complete our analysis, was the level of creative institutional destruction. Creative destruction could be indicated by new business models underlying Web 2.0 services. The results show that most businesses still rely on advertisements as their main source of income, just like traditional media companies have done for years. This does not indicate any changes. But our analysis of revenue models of Web 2.0 service indicates that hints of creative institutional destruction can also be detected. Users are increasingly incorporated into the revenue model of services. Not only as paying actors, but also to have a share in the revenue. Looking at other elements of the business model of Web 2.0 services, like value proposition and the way services are cooperating, it becomes clear that services are creatively employing their users' activities. But it also needs to be underlined that the openness of these services can be questioned. Figures about open source projects and P2P file sharing indicate that only a few services are truly open in technological sense. We may therefore conclude that up until now we can only see indications of 'relative' creative destruction. Although substantial changes in the organization of business models, are noticeable, there still are no strong indications that traditional hierarchical relations are fundamentally changing.

We think that Internet developments indeed have taken us to a second stage of sustainable growth, characterised by high deployment and a better match between the 'new' technology and the socio-economic context in which it is deployed and embedded. Since we are at the very beginning of this period, we still have some doubts about the classification of this age as

a “golden age”. Still, a lot of uncertainties exist. These have been highlighted in the section of this paper about the possible future.

7.1 Research note

Although our analysis of Web 2.0 services does shed some light on the nature and use of Web 2.0 services, it needs to be underlined that we are still at the beginning of this exploration. The data that we have used still needs to be further supplemented and refined. Furthermore, to enhance the analysis, more data should be collected that shed light on traditional user roles and business models. Our explorative approach also could benefit from some conceptual refinement and more data should be collected. Nonetheless, this exercise has proven to be a first step in a very interesting direction.

7.2 Follow-up

A lot of interesting questions remain unanswered. There are many questions that concern policy implications. As Pascu et al. have already stated, “The development of Internet 2 applications also opens a wealth of policy-related research questions”. For example how countries are going to approach global Internet issues, or the way we are going to deal with intellectual property rights. These questions will prove a true challenge to policy makers.

But also in terms of social and economic impact, user roles still need to be further investigated. What is driving users to take on this variety of roles and how are they going to behave in the future? These issues are inextricably linked with business-related questions. Will the market stabilize and will businesses be able to structure user behaviour or make a decent living out of their Internet activities? These questions seem relevant from scholarly as well as market point of view. Since we are only at the beginning of the period of high deployment, the online domain will be a continuing source of research material. We need to collect more and reliable data on online services and user behaviour. This paper is a first small step in this endeavour.

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**Kairos – Tomorrow’s Communication and Reachability Management:
Applying User-Centred-Design-Practise To Create Innovation Driven By Contextual
User Needs.**

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Abstract

This paper describes results of an explored application field in the ICT based on a user-centric-concept and shows insights of a practical design-approach focussing on the identifying and creation of service innovations in the core field of telecommunication –communication and reachability management. Based on qualitative user-interaction, emphatic observances as well as contextual inquiries and creative focus groups with experts need structures have been identified, transferred into service-concepts and the relevance of the future benefit potential was demonstrated.

Key words: Reachability management, communication and reachability context, user-centered-design, digital service innovation, contextual need analysis, service creation, kairos;

From the perspective of the telecommunications sector, the focus for the past five years has been on technical transportation systems – such as GSM WAP, GPRS, WiMax, Bluetooth UMTS, Edge etc. – in connection with downloadable multimedia content. Little innovative attention has been devoted to the revenue classic of voice communication as focus tended more towards offering voice customers additional portal and data content applications in order to realise the incorrectly high revenue prognoses with data applications and traffic after all.

In most cases however, the “real” needs of communication customers have been given little attention. The data content portal strategy was only marginally successful as regards its return on investment. New potential areas for sales are being sought – particularly when presented with increasing competition among IT and TC companies in the converging IP market.

With the upcoming personal, fixed-mobile synchronous and asynchronous communication user faces new challenges in convergent dealing with his communication management.

Since the invention of the telephone we have witnessed a revolution in the development of communication opportunities. In the beginning, reaching users was dependent on the user being close to a fixed telephone with a set telephone number at the end of a line. Today users are faced with a large number of different communication channels and end devices with different telephone numbers and addresses: e.g. fixed phone, fax, e-mail, cell phone, short and multimedia messaging services, voicemails, internet chats, instant messaging like Skype, ICQ, twitter etc. Now users are confronted with a new challenge, that of being able to manage their personal reachability and communication needs across different forms of media in an accomplished way.

The current trend in the emerging IP world of communication involves taking a step

backwards and focussing attention on the user, encouraged by the new applications of Internet 2.0 where IP users reinvent digital applications for their respective needs and characterise them with their own personal content, communication and network community relations. „The bigger the city, the more likely it is that a user will be able to find just the right clique because the overall supply of social groups and watering holes is so vast.“ (Ziv, Mulloth, 2006) Even if the first successful business models of Web 2.0 applications in the areas of User-Generated Content and Mobile Social Software could be termed overestimated and less than consistent, significant need structures and principles have however become apparent. These indicate an innovative and intensified desire for participation and communication on the part of users. Internet and wireless are no longer individually useful but are rather merged into technology and used in a collective, entertaining, context-interactive and interchangeable manner. User-creative is what this trend of Mobile Web Convergence 2.0 could be called. Mobile Web 2.0 is focused on the user as the creator and consumer of content ‚at the point of inspiration‘ and the mobile device as the means to harness collective intelligence. (s. Joakar et. al. 2006) But this turnaround is not in fact as new or surprising as currently suggested. The exchange, networking, customer-generated content and collective distribution of communication have always been valid and strong need structures throughout history.

The content of classic telecommunication services has always been “empty transport channels” filled with “user-created” content. Even carrier pigeons at the time of Pharaoh Djoser in 2600 BC were out and about with individual messages (s. Dauk, 2004). Seen against this background, synchronous “voice” applications or asynchronous services such as SMS or e-mail communication have always been “2.0”, i.e. they were created and used by the user or subscriber and thereby strongly aligned towards the needs of the respective communication user. Since the era of Graham Bell 1876, the telecommunication sector has been offering channels for transmitting user-created content which the user fills and then uses. Use is sometimes as planned and intended yet entirely unexpected to date. The history of SMS (short text messages) is only one such example. Users have displayed astounding creativity over the years in the application of “reachability” in particular, e.g. in how they have invented, established and exploited a variety of new communication opportunities in the form of ring tones or mini news snippets. Nevertheless, the telephone is still a “blaring madcap which unexpectedly interrupts the recipient of the call” (s. Flusser, 2004 – translated by author).

The mobile and social-interactive context of users will be of interest in the future. Users see the merging of previously technically diverse transport channels as permitting communication options to be used in parallel (i.e. synchronously). Convergent and multimodal communication and reachability management is becoming possible, i.e. a proactive decision as to how, when, using what channel and preferably at a certain time contact is established. Other new design options are in the area of “knowing who is where and what he is doing at a given time”. This type of presence and near-realtime know-how about people, situations or events applies as a new quality and increase in efficiency in communication, particularly in communities.

Kairos, the Greek god of the right or opportune moment, can be regarded as a guiding figure for future improvements in context-related communication interaction. The aim is to apply all forms of communication in a sensible and targeted manner as well as adequately adapted to the current context. However, with its various technical transmission channels and standards, communication technology has some considerable catching up to do in this regard. Reachability and the professional management of various communication variations available are therefore long-running issues. Especially against the backdrop of the new and future possibilities arising from telco-convergence and the variation opportunities offered by IP

communication, an immense uncharted area of development emerges for services, applications and the design of new business models.

The aim of this paper is to analyse the experience of three different development projects from innovative practice and research to analyse, derive and systematically depict the relevant and particularly manifest parameters for designing future reachability solutions. Derivation focuses on the actual user who formed an active component of the analysis and development phases in each of the three projects. The condensed results are presented on a structural, practical and theoretical level – giving insights and working out the relevance of the field communication and reachability management for future service creation in telco-convergence.

What is Communication and Reachability Management?

Management of communication and reachability in the ICT are difficult to record and are subject to definition. The semantic area of the term of reachability is: Accessibility, availability, roaming, ubiquity. Most of the terms describe a technical context of being reached and furthermore these terms describe the possibilities of communication “connectivity”. Nowadays nearly in all regions in most of the developed nations there are accessible mobile infrastructures which support the concept of always being connected (Salkintzis, 2004). So reachability is mostly used in backgrounds of technical research and coding context of networks. As early as 10 years ago, the challenges and opportunities of the issue of reachability management were depicted in technical research projects. Back then however, the focus was on the issue of multilateral security and protection. One research project in Germany examined the potentials of a reachability management service intended to filter out unwanted callers. Furthermore, recipients were also able to individually adjust and manage various role profiles (s. Reichenbach et. al. 1997, Rannenber, 2000).

Up to now the topic is not examined and defined straight from the users’ point of view and with focus in the converging technologies and innovations. Reachability in the context of the analysis presented is defined as follows:

Optimising the design and creation of reachability has the objective of the persons involved actively influencing and utilising an optimum channel and time within the framework of planned or intending communication interaction.

Within this paper the focus is on the users point of views. The need to reach or be reached by someone or something is the basic requirement of any type of communication. Reachability management basically enables personal communication.

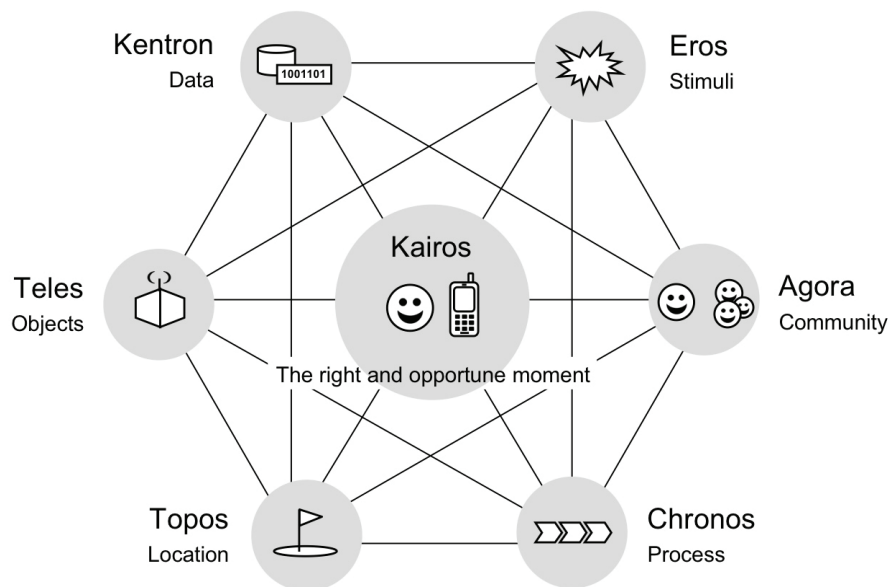
Customers can select the incoming and outgoing digital communication channels as well as steer them and individually adjust personal reachability in accordance with their current context and change it using the multiple possibilities available. Reachability concerns both the classical model of sender and recipient of communication interactions according to the communication model of Shannon and Weaver (s. Nöth, 2000, p. 244). Knowledge of the current status of reachability is essential if communication is to be successful. The range of possibilities for contacting and communicating is vast. Depending on the context knowledge availed of by the recipient, selection of the communication channel is shifted to the sender.

Communication is the most central requirement of society. In the past migration levels of information and communication technology, the management of multiple communication possibilities was given little attention. Developments concentrate on portal access and content management although it is obvious that the potential is currently being increased.

Reachability principles and parameters from the user's point of view

The principles of reachability basically have to do with the sender/actor and receiver of the communication interaction. In addition to that the following aspects are playing a major role for the integrated communication in future.

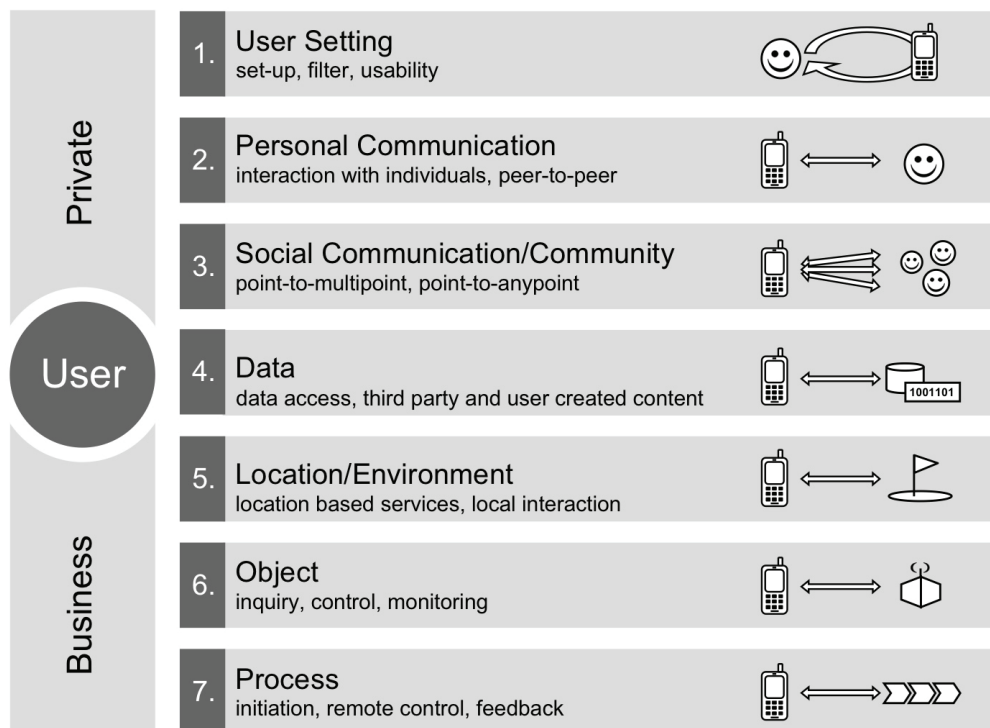
Figure 1: Identified interaction principles of reachability from the user's point of view



- „Kairos“ Knowing the right or opportune moment for communication and the best channel.
- „Kentron“ The central data port or web based interactions.
- „Eros“ The intention of prompt interaction and the stimuli of communication. Optional a situation or location based initiation of communication activities.
- „Agora“ The principle of a market place for sharing information and communication within a defined community.
- „Chronos“ The remaining time, planning and coordinating of process based managements
- „Topos“ The location and environmental relation, furthermore the deposition of items.
- „Teles“ The remote interaction with and to things, distance steering and control.

Reachability, availability and connectivity are the requisite trinity for ensuring that communication takes place in accordance with the expectations of the communication participants, whereby managing reachability or optimising communication as regards. Reachability Management describes the same objective, i.e. perceiving the context of reachability as being capable of design in an active and passive sense and utilising it to optimise existing forms of communication. At the same time, individual development of new forms of communication is possible.

Figure 2: The seven basic parameters of contextual reachability management



On closer examination the topic reachability management can be differentiated in the following seven basic parameters. These possess a strong validity from the users point of view both in business and private usage context. The parameter will help for a further segmentation and systematic analysis of the examination field. The following characteristics can be defined:

- 1. User Settings: set-up, filter, usability, device/system/service interaction
- 2. Personal Communication: interaction with individuals, peer-to-peer
- 3. Social Communication/Community: point-to-multipoint, point-to-anypoint
- 4. Data: data access; third party & user created content
- 5. Location/Environment: location based services, local interaction
- 6. Object: inquiry, control & monitoring, objects around, machines,
- 7. Process: tele remote, process warning signal, tele-observation

The combination of the presented parameters is the next step for further systematic analysis of the complex and wide spread examination field of reachability management. To develop simple and understandable abstract patterns and principles in which reachability can dissected is the generally accepted fundament for the focused user-centric design approach.

Reachability context

The identified area of potential in the “customer-oriented telco-convergence innovations” of the future concerns design of the “reachability context”. In the migrating IP convergence world of the future, a variety of IT and telecommunications applications will merge. What’s more, new possibilities will arise and technical realisation of a wide variety of types of communication will no longer be the key problem with focus centring on adequate and customer-friendly preparation, depiction and increase in quality of the possibilities in the

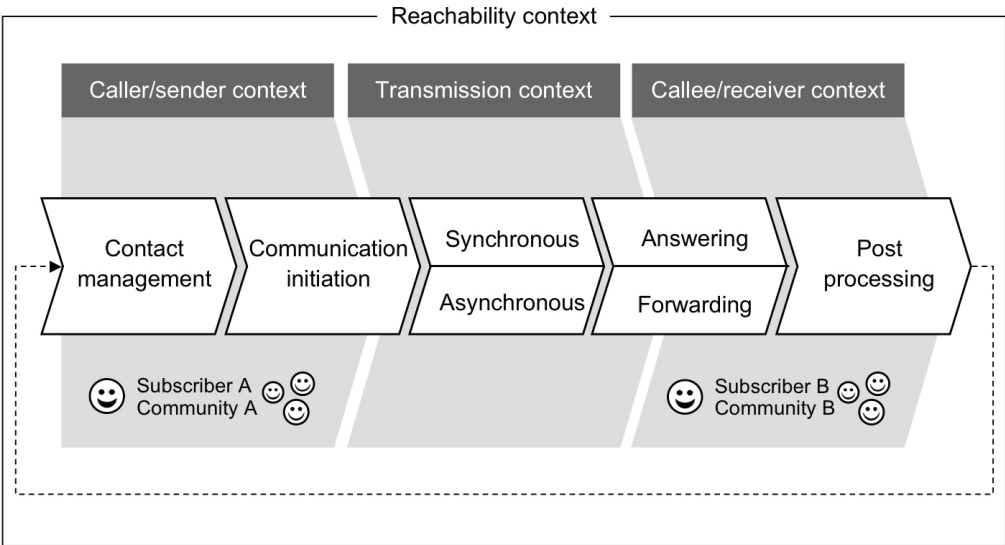
context of reachability. The existing and future possibilities associated with interacting and communicating with people, items, places and processes at all times and everywhere via a wide variety of possibilities will require innovative management and uncomplicated customer communication of future offer portfolios in this area. The basic issues for future application designs are:

- What types of communication are available? How popular are they among users?
- How can the diversity of offered possibilities be comprehensibly made accessible to a wide base of users?
- How can communication and interaction be simplified?
- How can reachability be optimised as regards individual participants and situations?
- How can times and the type of communication application be optimised?
- How can existing channels be enriched?
- What choice of communication is the right one for what purpose as well as being promising for a certain time?
- Are there any potentials for new types of communication? Needs that have as yet remained undetected?
- Can a “Communication Richness Theory” already be defined today from the customer’s point of view? (s. Daft, Lengel, 1986)

The fundamental goal is to improve competence and the successful and targeted application of multiple communication options on the part of the user. The success and quality rate of a type of communication should be increased – either technically or in terms of acceptance.

The reachability context is defined as the “active and/or passive context in which all possibilities and requirements of digital technology can be designed in terms of IT and telecommunication from the user’s perspective”. The context definition includes the prerequisite, intention and planning as well as implementation and follow-up of a digital communication activity which involves one or more sending or receiving participants interacting in various ways (synchronous or asynchronous transfer channels).

Figure 3: Reachability context along the general communication/interaction process



The following individual issues are of relevance in this communication process:

- Updating and managing contact data

- Context specific list of fitting interaction partners based to the user's intention
- Preselected list of possible communication channels
- Adjusting role definitions for persons or contextual situations
- Analysis of current context parameter with automatically definition of fitting reachability rules based on the user's behaviour in the past
- Intention sample for communication activities
- Selection of communication options (communication channel or medium)
- Time- and context-related influential factors in the success or failure of reachability
- Statistical documentation of communication structures, samples and networks
- Individual saving and structured storage of messages and interaction events like voice call, instant messaging, chat etc.

Key position in these definition of communication and interaction process are the respective usage contexts and environmental parameters the user are in. Here results some important factors and requirements for optimising the communication process on the shown steps.

The analysis approach

The convergence potential was examined methodically and creatively in various analysis steps, whereby the aim was to validate the persistence of the future relevance of the area over the medium term. The second step involved performing qualitative user observations and focus interviews supplemented by expert ideas and opinions in order to outline the potential specifically in rough concepts.

The focus of this publication involves an insight into the selected results of observation and interview interactions. The emphatic analysis approach was deployed over a period of six weeks with a total of eighteen coached observers in three selected everyday contexts. Prioritised contexts are:

- the family (at home and out and about)
- job-holders (during their working day, at the office and on business trips)
- and as a cross-section area for the user groups observed in a recreational context.

The observers were sensitised in advance to the issue to be examined in order to document user requirements and typical or conspicuously different behaviour. The basis for the contextual introduction was a definition and delineation of the issue of "reachability and communication" from the user's perspective.

The observers were given a type of diary and orientation guidelines to document the discoveries observed and experienced by them. Particular importance was given to the description of individual situations and statements of individual users. Furthermore, the results were continuously evaluated within the framework of individual discussions with the observers every two weeks.

Results from the private/family context

The results of individual analysis contexts are summarised below as examples. Within the framework of this article, results were compressed and reduced to the "major" phenomena. For the purposes of improved comprehensibility, additional core statements by observers and users observed by them are depicted and described as well as some detailed behavioural situations.

Core statements by the observer:

- “The telephone rang three times in a row at a friend’s house and each time it was a pre-recorded automatic prize-game announcement.”
- “When I get home in the evening and listen to my answering machine, three or more automatic prize-game calls are on it some days.”
- “A bouncer for calls to my mobile”
- „To know the cause why the caller ringing is a strong need identified at all observed people. There are no exception to the different situation contexts of the callee.“
- „New communication channels are wanted – something shorter than SMS only for one stop information – no interaction.“
- “Stay in contact, check daily organization tasks and take care on each other is need of families. Existent communication tools are not perfect for realizing this. Means all time interaction – silent watch is not possible.”
- “The user don’t want to forget important dates and communications as well as seeing who is next on calling list.”

It was then possible to derive and prioritise the following needs and requirements concerning reachability and Communication Management using convincing observations and statements by users in private contexts:

- Owners of land-line answering machines at home do not always use them as designated, i.e. they are not only used as answering machines taking calls in their absence but rather for listening in to incoming calls. “Listening in” on calls as a basis for deciding whether to take such calls or not was a phenomenon which was regularly observed.
- Automatic selection of the nearest and most convenient communication device and/or easy and flexible change from one end device to another was derived as a requirement. At home, the persons under observation preferred their land lines over their mobile phones.
- Another aspect in connection with incoming calls is control and/or use of intelligent voice spam / spit filters. This request is increasingly perceived by observers against the background of a steady increase in undesired advertising and prize-game calls.
- There is a distinct desire for preliminary information on incoming calls. In all call contexts observed, incoming call numbers are always scrutinised on the display first. Unknown or hidden numbers are not even accepted in half of all cases.
- Presence information for the sender. In small informal groups in particular, there is a definite request for “invisible” control and security. For example, in many cases persons use an agreed ring tone to let each other know that they’ve arrived home safely or that everything is ok.
- In the younger “kids” scene, coded ring tones are used to indicate to someone, for example, that the user can now be reached via another communication channel such as Instant Messaging (ICQ). This behaviour can simultaneously be seen as an indication of the requirement for new communication channels somewhere between calls and SMS/MMS.
- Communication and contact management were identified as a neglected or unpopular issue in private contexts in particular. When questioned about the topicality of their telephone book entries, more than two-thirds of those interviewed told the observer that a third of all the numbers stored were almost certainly no longer in existence. The time-consuming task of regular updating is annoying especially owing to the lack of synchronicity between land lines, PCs and mobile phones.

Results from the business context

The observers deployed in the “job” context had the task of observing themselves, their colleagues and others in their daily dealings with communication and reachability. A selection of documented core statements and observations reveals some indications for innovative applications or improvements in the reachability context of working lives:

- “Knowing how, when and where the person I wish to contact is best reached would save me a lot of time and bother every day.”
- “When I wish to let someone know something important, I try to reach them on all channels, one at a time: land line, followed by mobile or even e-mail.”
- “There’s nothing worse than sitting on a train talking to an important client on the phone and the connection suddenly disappears as you enter a tunnel.”
- “Meanwhile, I know my standard train routes inside out and know exactly when I need to end a phone call prematurely.”
- “Sometimes you keep missing each other’s calls – leaving three or four messages on each other’s voice boxes.”
- “I don’t use reachability profiles – the settings are far too complicated.”

The following needs and user requirements could be identified and derived from the documented and reported observations and statements by the observer. These results vary depending on whether they represent the sender’s or recipient’s perspective.

- Callers desire transparent preliminary insight into their communication partner’s reachability at a given time with a display of the communication channels available. This knowledge facilitates the process of choosing the “right” communication channel.
- Certainty as regards important information/news being delivered: everyday working situations involve urgent news often being left as multiple messages and on various recipient media. Accordingly, when the recipient is not reached, a message is left on his land-line answering machine first, followed by his mobile phone voice box and finally an e-mail is sent along for good measure.
- Comprehensive presentation and management and/or editing options as regards messages/calls left on voice boxes: targeted access to individual messages is demanded as a function just as much as the possibility to swiftly skip or ignore messages.
- Preview of own network availability/reachability particularly in mobile contexts with restricted reception quality, e.g. on trains.
- Specific indication of good reachability of individual persons or defined groups of persons: some of the persons under observation have solved this requirement by means of agreed coded ring tones. Allowing business mobiles to ring twice indicates a good time for a call, for example.
- In meeting contexts, a requirement on the part of recipients was derived as regards individual reactions to incoming calls, e.g. selection of direct brief feedback at the touch of a button. Consciously rejecting calls or cutting them off is still regarded as an impolite gesture to be avoided.
- Recipients criticise the lack of possibilities to steer and control all communication centrally on a single platform. Common administration of land lines and mobile phones, e.g. in the form of a “common” voice box or contact/address book, is one request.

Need orientation – function principle – case study

From the shown results prioritised needs have been translated into over 100 detailed usage scenarios. Furthermore general accepted function principles were defined overall the examination contexts. These principles offer potential generic development approaches for application design in the field of reachability management. They can be positioned to three steps of the communication process defined in the beginning (s. figure 3).

- Communication transfer and enrichment: using a new communication channel with individual multimedia information.
- Communication initiation and reachability preview: focused on the informed communication channel selection.
- Contact management: user generated address book with easy synchronising functionalities.

The described principles were used to design and define exemplary reachability services. In the following three concrete application are demonstrated as case study. Within these examples the estimated potential of reachability services can be proofed.

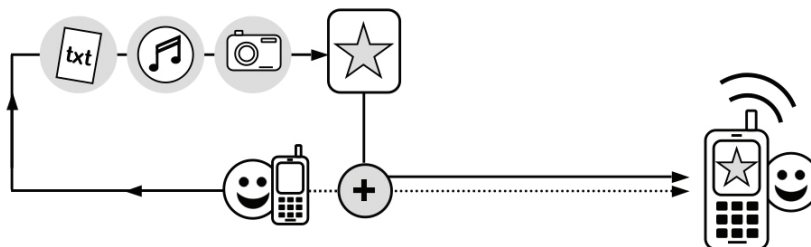
Case study I: Pre-com-enrichment – additional information during call setup

“Pre-com-enrichment” applications denote a new previously unutilised communication area in the call process, i.e. incoming calls, where to date only so-called Call Line Identifiers are communicated with the result that the caller’s number is displayed on the recipient’s end device display. The basic principle of enriched calls utilises the extended technical possibility of transferring additional information caller-initiated/controlled at the same time as the recipient’s call is set up. This process taps an innovative multimedia communication channel in the call process.

The application offers callers the opportunity to dispatch additional information as the call is being set up with the recipient (B). This additional information can be preconfigured in terms of the application or user or even content individually created by the user.

Personal design and active dispatch of pushed information parallel to call setup offers user-wide enrichment of the call context. The recipient (B) receives additional information along with the incoming call, e.g. information on the caller, call content or other content compiled and selected by the sender (A). The additional transparency and preliminary information gained optimise the typical call process, attributing it an entirely new quality.

Figure 4: Case study pre-com-enrichment



Case study II: Presence context checker – preliminary insight into recipient reachability context

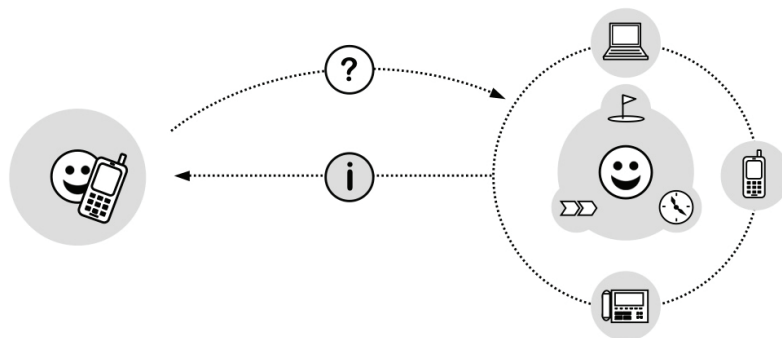
The application developed offers the caller or sender a type of communication centre in which all of the recipient's possible communication channels can be viewed at a single level, i.e. voice, SMS, MMS, IM, voice box / mail box etc. A simple icon system, e.g. a type of traffic light system, indicates the current quality or appropriateness of reachability on the various channels with the result that upon selecting the desired communication partner from an address or telephone book, the sender gains an insight into the communication channels available depending on the selected communication partner's current status or presence settings.

The process allowing a preview of the communication channels available is based on the principle that the user has released his current reachability settings for a defined group of people.

The current presence settings are either automatically set and released via predefined regulations or actively by the recipient depending on the given situation. A decisive factor for the process is that all of the communication channels available to the user are steered and managed in a synchronised manner via a presence or status profile.

The preview permits the sender or caller to select the most appropriate communication channel for his respective situation – in a targeted and knowledgeable manner. Unnecessary and superfluous communication is thus avoided.

Figure 5: Case study presence context checker



Case study III: Contact generator

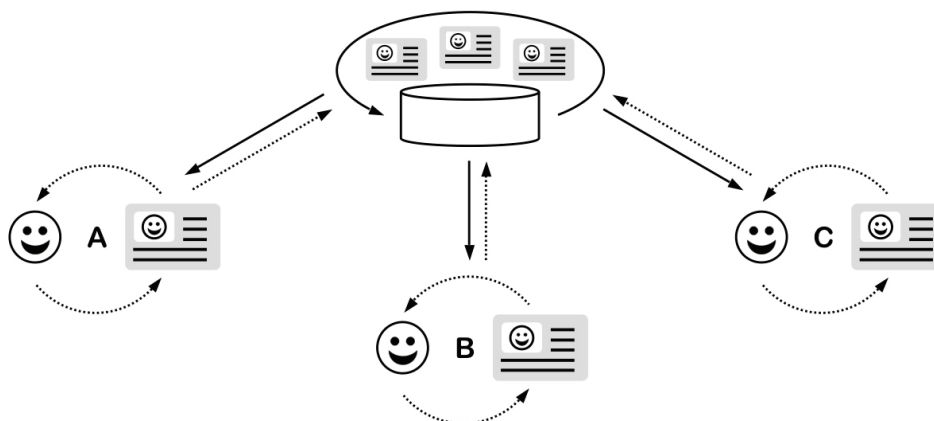
The contact generator is a community created and administrated phone book – relating to the contextual communication and reachability possibilities of single users or user groups. Although it offers the technical solutions for all of these problems and the (basic) requirements on the part of users as regards the “telephone book” system can be clearly defined, no application has yet managed to fully satisfy this requirement (s. Skalsky, 2007).

- Why are directory inquiries (e.g. 11833 in Germany) still required for finding telephone numbers or addresses although a single online query is possible at any time, even from mobile phones?
- Why is it not possible for contacts to be simply adopted from old mobile phones when users buy new ones?

- How much of the contact data in personal telephone books is actually up to date?
- Why must each user manage information on numerous other users in his telephone book?
- Why do some telephone participants still try to reach others on their old numbers?
- Why doesn't the telephone book know before active calls are made whether the recipient's line is currently busy or his mobile phone is switched off?

The contact generator represents a type of mobile, user-generated telephone book. Users have the opportunity to enter and manage their own personal data and release it in a differentiated manner to other users within the platform. This also gives the user the possibility to link his contacts in the telephone book with the current profiles for the contacts recorded in the contact generator. The old static telephone book is replaced with a new fully-dynamic service which provides up-to-date contact data at any time on the basis of content managed by the users. Apart from the contact data, blog content, photos and videos in individual profiles can also be published. Furthermore, the service is intended to take consideration of the current location (e.g. downtown Moscow), current activity (e.g. meeting) as well as the reachability options on the part of the recipient (e.g. business telephone, e-mail, instant messaging) by analysing the mobile context simply by searching the telephone book. An extended search function utilises various filters to permit searches of all registered and approved contact data replacing the function offered by telephone directory inquiries. The aim is to create a standardised service for contacts which can be deployed independent of devices and platforms.

Figure 6: Case study contact generator



The three case studies above improve the possibility of further reachability services with a real demand on the users' side. The shown case studies have been evaluated in focus groups using mock-ups and click dummies (s. Gerstheimer, Lupp, 2003, 2004). The exemplary use cases depend on generic function principles. Based on these principles a wide range of similar services can be realized – highly customized to the needs of different target groups.

Conclusion

The management of reachability is the true and “bumping” heart of communication and interaction – in the past and especially in future converging markets.

The classic communication channel, like voice has always been used from the very first by user-created-content. Kairos, the greek god of the right or opportune moment is the guiding

figure for future success of novelty and innovation in communication and reachability management. Having pre-views to the intentional receiving context of communication is one important application field driven by presence functions and role management. Optimizing the handling and gathering of phone book data, or more open formulated – user created contact data bases – is a second important field for reachability services. In both application fields the new “thinking in appliance” is necessary. In the future a broad range of communication possibilities are possible on the same usability level of selection and intending interaction. Relating to the reachability status and near real-time or presence interaction in between the communication parties will be optimized. Selecting the right and contextual interacting communication channel means having detailed knowledge of the reachability status of the receiver’s (group) context.

This contextual “televiewing” into the wished reachability status enhances the quality of communication and interaction between the communication parties – independently of a synchronous or asynchronous communication channel. Therefore many of new challenges are coming up in the fields of security, integrity and authentication.

The innovation field “reachability context” has many revenue relating service opportunities. Pre-viewing, one-time-numbers, blind-calls, VIP-filter, VSMS (very short message service) and many more identified need based applications for IP-based convergence in telecommunication- and IT-communication-fields.

Showing up the relevant reachability context for service creation and selected insight of detected need structures has been presented. Based on observer input and qualitative focus groups relevant interaction structures were focussed into the creation of over 100 typical usage-scenarios. These have been clustered in creative expert groups into three different and for the telco-convergence important application concepts. The service creation was guided by the integration of users into the design process.

The daily communication and reachability habits of users have shown significant and diverse amount of optimization potential for new and existing service innovation. Reachability management and media convergence aspects represent a field of application for innovative ICT developments that has been largely neglected until now. The small “inconveniences” with which users have to struggle in their daily use of communication represents an area that has a high validated benefit potential for users and provider of services in the field of communication and reachability management.

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Users As Developers In Information System Projects

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Abstract

Users have been described as necessary experts in information system developments. This research introduces a viewpoint that the users are the main actors in development projects and the other participants only give their experience for the use of the actual developers.

In addition to the strong involvement of users, our research emphasises the special nature of the information system project with earlier-made specifications. This article suggests that in order to achieve a successful output, a reflective and flexible working process is needed. This suggestion is valid especially in a case that is out of the line of common approaches that are described in the literature.

The research approach in this study was qualitative and the empirical material was gathered from a case study. The approach was subjective and it necessitated interpretation when analysing the results. The case included an information system development that was carried out to produce an inter-organisational information system to support certain functionality between organisations. Despite the output was an information system, we argue that the approach with active users is also applicable in the development of any other artefact.

Introduction

This paper discusses the role of users in an information system project where the future users participated in the development work. User participation has already been noted in information systems development and its significance is notified. However, the approach is generally that of the information systems developer. We aim to reflect the users' point of view instead of the implementer's approach. We note the importance to keep users involved even in situations that they feel not important or when they perceive the technical issues too difficult to be understood.

Our case comes from a case where an inter-organisational information system was developed to support officials when they managed specific functionality between their organisations. The officials were experienced in their affairs but not in information system technology or information system development. In addition, acting in a project was not their common way to work. Besides by officials, the information system would be used by thousands of other users. However, the other users would only use the system to apply for permission and the main functionality was planned to support the officials. Therefore, only the officials were represented in the development work. Despite the feedback received from the other users was mainly shining, the users were left out of the scope of this research.

Literature recognises users as an important key factor. The role of user participation in information system developments has been under discussion already for decades (Markus 1983, Kensing & Blomberg 1998, Dewulf & van Meel 2002, Halonen 2005). In our case the

users acted as key players and we argue that without their active involvement the output would not have been achieved.

There is not much literature about information system developments made by several users representing different organisations (Dahlbom, oral communication June 11, 2005). This paper contributes this gap in the information system research. In this paper we point out the actions of users that strongly influenced the output and its characteristics. The empiric material is gathered from memorandums, emails from project participants and a personal diary written by the researcher. The interaction between student affairs officials and the researcher was active and it was carried out in good terms.

Our empirical case comes from information system science and the artefact is an information system. We believe that the findings in this research can be generalised to concern any other development projects and artefacts in them.

This article continues with a literature view that introduces the framework for the empirical case. After that, the research approach is explained. The empirical case is introduced next and it gives evidence and findings from the inter-organisational information system project. In that chapter, several quotations are expressed and they display the true attitude of the project participants. The article ends with a concluding discussion that emphasises the findings of the research.

What we already know

To simplify, an information system consists of a set of interrelated components that collect, process, store and distribute information (Laudon & Laudon 1998). The definition by Laudon and Laudon does not include people. However, we want to emphasise also the need of human beings in the composition and take another definition: *“Information system means an interconnected set of information resources under the same direct management control that shares common functionality. A system normally includes hardware, software, information, data, applications, communications, and people.”* (ostinato.stanford.edu/hipaa-feedback/definitions.html). Formal information systems can be either computer based or manual. Manual systems use paper and pencil technology (c.f. Halonen 2004a) while computer based information systems are dependent on computer hardware and software technology (Laudon & Laudon 1998).

Information systems have a life cycle, like any new artefact, and traditionally it is represented as Lucas (1985) expressed it already twenty years ago:

Inception → Feasibility study → Systems analysis → Requirements analysis → Design → Specifications → Programming → Testing → Training → Conversion and installation → Operations.

Information systems are implemented in organisations because the organisations tend to improvements with their business processes and efficiency (Hevner et al. 2004). Organisations benefit from integrating their information systems but this integration is challenging and needs careful planning (Kudrass 2006). Furthermore, developments in information and communication technologies have enabled the improvement of the efficiency and effectiveness of administration with government (Gichoya 2005). With the developments, government services may be located closer to the citizens.

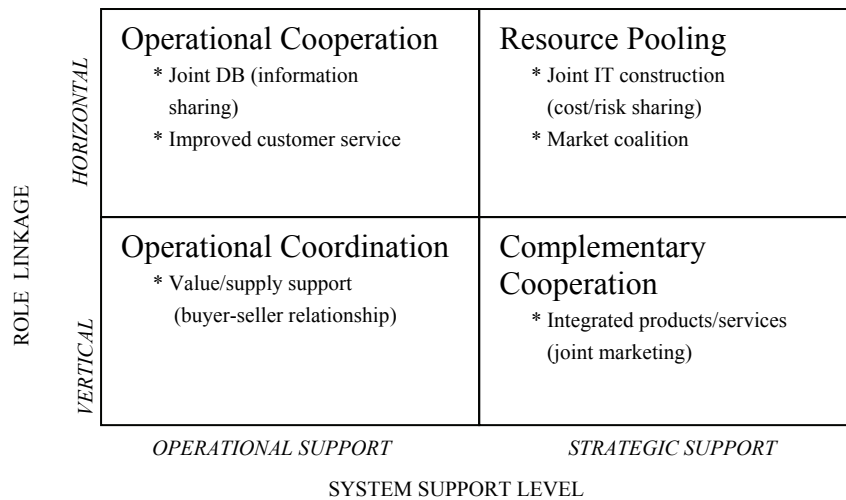
User participation in information system developments has for decades been considered to be critical to the output of the developments (Barki & Hartwick 1994). Users are the right persons to explain the whole work process that is to be replaced or supported by the new information system under development (Halonen 2007). On the other hand, communication problems between users and designers are recognised as a major reason why user requirements are not included in information systems and why users are thrown away of the implementation project (Laudon & Laudon 1998). In addition, users and information technology developers typically belong to different organisational units with different objectives and values (Gefen & Ridings 2003). Therefore, in many cases users are not or cannot be actively involved in developing or testing new information technology. Despite that, Gefen and Ridings suggest that information technology developers should strive to create relationships with their users that will reduce any polarity between users and developers. Noble (1986) stated already twenty years ago that the role of users compared to that of the designers should be very carefully considered.

From the users' point of view, in information system implementations it is not enough that the organisations tend to improvements with their business. On the contrary, the users need reasons to use new applications. Keefe (2003) emphasises the importance of focusing on the user in every phase of the system development. Users must be motivated to deliver their knowledge when developing new information systems. Without motivated users there is no traction to get the implementation project to succeed, Keefe argues. Halonen (2004a) verifies that argument with her findings among factory workers who did not want any new information system to record their work. Adding to that, Kujala (2007) concludes that the most significant user involvement occurs at the beginning of product development, when the decisions about the product and its nature are on table. Kujala argues that the process of early user involvement needs to be simple enough to be practical in product development. Despite the novelty of the article by Kujala, we find its approach still biased.

Managing interpersonal cooperation in information system implementations is described as a challenge (Barki & Hartwick 2001), and in inter-organisational information system developments this challenge even increases (Halonen 2004b). Very often the challenge is too great to be overcome as the failure rate still exceeds 80 percent (Furton 2003). The failure or success of a project is often a perception that is influenced by people who have different backgrounds and experiences (Rad 2003). However, it is not axiomatic if an information system project is a success or failure, as Larsen and Myers (1999) discuss the question of what if an information system turns out to be a failure even if it was at first evaluated to be successful.

Inter-organisational information systems allow the information or processing capabilities of one organisation to improve the performance of another organisation or to improve relationships among organisations (Laudon & Laudon 1998). In this sense, information flows across organisational borders and the role of collaboration is emphasised. Hong (2002) introduces a framework for inter-organisational information systems with horizontal and vertical linkages (Fig. 1). The focus in the framework is on participants' roles and it points out the need to examine the system in terms of how the participants' roles are linked with each other. The framework introduced by Hong classifies inter-organisational information systems into four categories: resource pooling, complementary cooperation, operational cooperation and operational coordination.

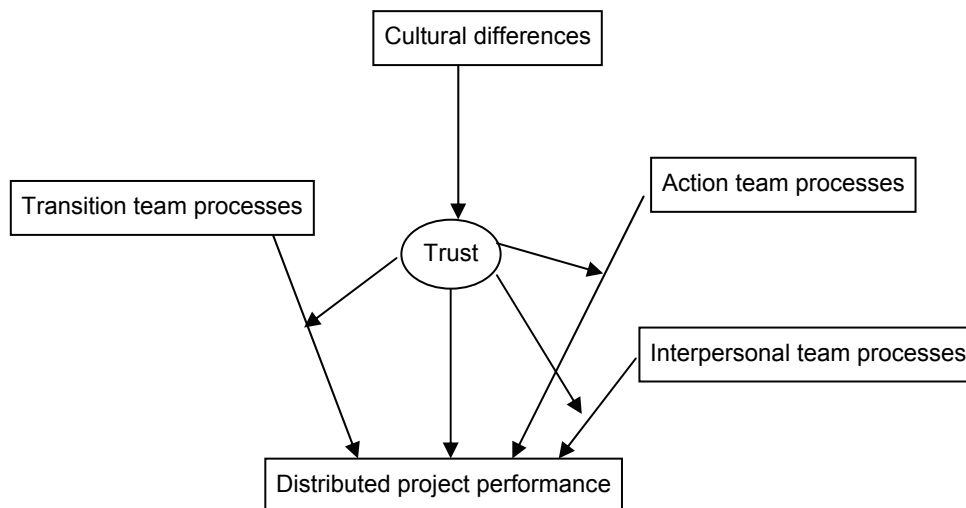
Fig. 1. A framework for inter-organisational systems (Hong 2002).



Collaboration in such inter-organisational information systems may be problematic if the goals of the participating organisations are not congruent (Halonen 2004b). Schrage (1990) describes collaboration as a purposive relationship that has a need to solve a problem, create something or discover something. This relationship is limited by constraints such as expertise, time, money, competition and conventional wisdom. Furthermore, Schrage argues that any technology that reshapes collaboration reshapes also the fields in which collaboration is important.

Collaboration is closely related to trust (Karahannas & Jones 1999). According to Karahannas and Jones, trust plays three interrelated roles in inter-organisational relationships: it may act as an obstacle to opportunistic behaviour, it may substitute for hierarchical governance and it may provide a competitive advantage. The importance of trust is highlighted in the management of any distributed projects (Evaristo 2003). Trust itself is influenced by cultural differences and trust influences action team processes, transition team processes, interpersonal team processes and finally distributed project performance (Fig. 2). Furthermore, without trust collaboration is less likely to exist. Evaristo concludes that the amount of trust may determine which goals will be given extra weight especially in situations where there are both competitive and cooperative goals.

Fig. 2. The role of trust in managing distributed projects (Evaristo 2003).



As trust is influenced by cultural differences the role of culture is worth taking into account in information system implementations. As a concept, culture conveys the feeling of a pervasive way of life or set of norms (Handy 1999). Culture should be defined in a holistic way and its influence on individual's behaviour should be considered properly (Gallivan & Srite 2005).

Academic organisations have their own cultural and national context where science is practiced, managed and organised (Hearn 2003). Hearn argues that universities are complex mixtures of classed, gendered and culture-bound practices where also power and moral relations are emphasised. Mintzberg (1983) stated over twenty years ago that universities represent professional bureaucracy that is described with coordination of the standardisation of skills and its associated design parameter, training and indoctrination. The organisational nature of universities can also be seen in implementation projects (Heiskanen et al. 2000, Kudrass 2006).

The concept of culture refers to shared values and attitudes within a specific organisation or other form of social grouping (Walsham 2002). Culture is not static. Instead, there are dramatic changes in many societies in areas such as attitudes to gender, the environment, race, sex, family life and religion. Walsham continues that in the context of globalisation, it is increasingly difficult for any group to remain isolated and uninfluenced by other cultures.

Cultural and social background has its impact on changes in organisations and on the implementation of new technology (Walsham 1993). The development and implementation of an information system are instances of organisational change (Davis & Olson 1985) that can be carried out in at least three different ways: 1) letting users not notice the change, 2) users noticing the new information systems, and 3) both information system and process change and users notice that (Markus 2004).

In their recent article Zhang et al. (2005) argue that users still are too little noticed in information system implementations. Therefore, often a gap is seen between satisfying organisational needs and supporting and enriching human users. To avoid that gap, the authors introduce a methodology for human-centred information system development. In

their literature review, Zhang et al. sum that human interaction with technologies should be driven by human's different levels of needs and goals. The fundamental message for this new approach is that the concern should be human-centred or human-oriented instead of task or technology oriented. Zhang et al. continue that it is necessary to communicate to the users or teammates about the human-computer interaction development activities and results.

Despite users and their contribution to the information system development are emphasised in the paper by Zhang et al. (2005), the users are not considered equal to the designers. We add to that with our research and explore the active participation of users from the beginning to the end of an information system project.

Research approach

This research was qualitative and the approach was subjective. The main research method was case study and the empiric material was collected from an information system project where an inter-organisational information system was implemented. The subjective approach enabled the researcher to reflect on her past and it also necessitated interpretation when analysing the research material (Walsham 1993). The material from the case was gathered by remembering Yin's (2003) notes about an exemplary case that needs to be significant and complete, to include alternative perspectives, display sufficient evidence and to be composed in an engaged manner. The case also offered a diversified environment with several stakeholders and project parties and therefore it represented an intrinsic case (Stake 2000).

The research material consisted of project memorandums, emails sent to the researcher, SMS's and a personal diary written by the researcher. The diary was written with a confessional style (Schultze 2000) and it reflected the project memorandums and emails, added with the subjective interpretations by the researcher. In addition, users had given feedback with a specific automated form and their feedback was independent on the project meetings or their atmosphere. Interviews were not carried because the researcher did not want to influence the response. However, triangulation (Klein & Myers 1999) was found in the research material because the emails and project memorandums were written by other people.

The diary met the criteria described by Schultze (2000): authenticity (the role and identity of the researcher was explained in the text); plausibility (the text was structured, following the timeline according to the empirical case) and criticality (the diary helped to understand the attitude of the researcher and was still questioning the objectivity of the data). In addition, a self-revealing approach was expressed by making notes about success or failure felt in the process (van Maanen 1998). In the diary there were notes about 350 days.

To ensure the quality of the performed research, the principles introduced by Klein and Myers (1999) had been in the background when carrying out this research. A hermeneutic circle was concerned when trying to understand the relationships between project stakeholders in the context of the inter-organisational project organisation. Interaction between researchers and subjects had been active in project meetings and encounters, including emails. Multiple interpretations were realised in this research by using both project documentation and the personal diary written by the project manager in interpreting events. The subjective interpretation of the researcher was questioned by using the several emails and SMSs that were sent during the implementation, giving evidence about the atmosphere and situations in the project. The principle of suspicion led us to evaluate the subjective diary of the project manager and the short minutes that were written about meetings and encounters.

Evidence and findings from an inter-organisational information system project

The empiric material was collected from a case in an information system project during the years 2003-2006. The researcher was called to act as a project manager due to her background and working experience in other information system projects. The researcher was called to a meeting that was held in June 2003 and the goal of the meeting was to get plans to set up an information system project. There were eleven persons in the meeting and the researcher knew only one of them. The attendees represented several organisations and they were experienced in the operations that the information system was to support. From this viewpoint, the approach of the forthcoming users was in evidence already before the project was even established.

The starting point for the new information system project was declared in the first meeting, as well. The basic principle was to use previously made specifications as a basis for the new information system. The goal was put in words by an attendee: *"We need a workable tool into use. With that we can prove the utility of the information system."* This goal was also formulated in other words: *"After three years there will be an information system in use in three organisations and it will be used to support our defined tasks. The assumed number of users will be one thousand."* These formulations proved that the information system (called eSystem in this paper) was truly waited for and a lot of expectations were laid on the project.

It took several months before people from all participating organisations were nominated to the project group. Due to other duties of the project personnel, there were also changes in the project group and new participants were nominated as others left the project. The project group consisted mainly of forthcoming users and they were eagerly waiting for the new information system. However, developing information system needed experience that was not familiar to people who had no previous experiences or knowledge about the tasks.

Due to the requirement concerning the use of earlier made specifications, the previously made specifications had to be carefully acquainted. This task appeared to be a tedious phase before the actual planning and coding could be started. The users did not find important to go through the documents and they were about to loose their interest in the development project. There were all together 94 files to be read and 19 of them were thoroughly evaluated and their usability assessed. The most important document was the description of the process that included the viewpoints of the actors and involved organisations along the timeline. However, knowing the process was not enough. Instead, the participants had to be able to describe their work processes from their own point of view. As there were many organisations involved, there also were many work flows needed.

The specifications made by other stakeholders caused troubles for collaboration. The project manager wrote her diary on June 8, 2004: *"She said that the project group has no more any rights to discuss or abandon the user interface that is made by them."* Later the conflict continued with a phone call from the vendor and the project manager wrote her diary: *"He insisted that the user interface is not in agreement with the requirements specification and it should be modified according to that."* The tension between the project manager and one of the stakeholders continued and the conflict was highlighted every now and then. The researcher wrote her diary on March 3, 2005: *"I recalled that the project had paid a lot for doing the user interface to look like their suggestion and many discussions and meetings were held because of it."*

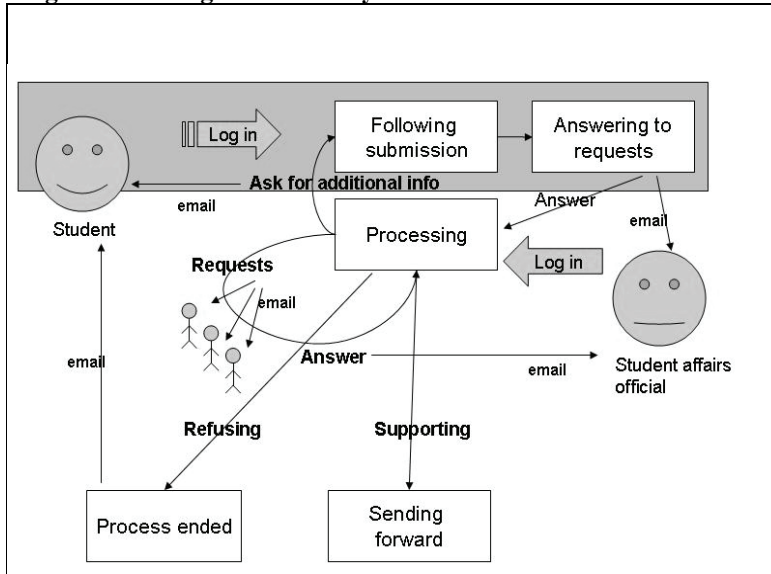
However, there were also positive moments in the project meetings. The researcher wrote her diary on June 11, 2004: *“The atmosphere was very warm and things seemed to proceed.”* In addition, the role of trust between project participants was emphasised every now and then. They kept saying in project meetings: *“Of course we rely on that the other officials offer qualitative services and do not suspect it.”* (Diary notes from a project meeting on October 25, 2005). *“I don’t believe that anybody would on purpose do wrong or anything unauthorised.”* (Diary notes from a project meeting on November 4, 2006).

As eSystem included also personal data, the security issues had to be thoroughly considered. The users were authenticated by a middleware called Shibboleth (Shibboleth 2007) that enabled the identification of the users with the usernames given by their organisations. The national Personal Data Act was to be conformed in depth. In practice, this requirement also necessitated the principles of transparency to be followed. That caused several conversations in the project group because the realisation of the principles were not jointly agreed. Some of the participants supported limited openness while others wanted to share all information that concerned the ones in question. *“Damned, sometimes this principle of information visibility is ridiculous! There is interaction between officers that does not belong to others.”* (Email in February 2005).

Except the outside vendor, the project participants were not technically oriented or experienced in information system developments. That is why the development work was perceived challenging by the users. Despite the modest experience, the users were asked to describe their work processes and requirements for the new information system. However, they were the best experts in their own work and work processes. It appeared that describing every-day work processes was found difficult in the project group. Therefore, the vendor had to suggest possible work processes to them. In order to help the users to understand the use cases, several pictures were drawn for them (Fig. 3). The figures were found descriptive and some of them were used when training new users after eSystem was piloted.

The approach of the vendor differed from that of the users. The vendor understood that every action had to be coded in the information system and that the actions also influenced other actions and the data. The forthcoming users were mostly interested in bigger functionalities and, from time to time, the smaller actions in the functionalities were not perceived important. Occasionally several discussions about the functionality and coding them into the process were felt annoying by the forthcoming users: *“You may do yourself an information system that you can learn to use and manage all the tasks for us.”* (Diary notes from a project meeting in March, 2005).

Fig. 3. Modelling the use of eSystem.

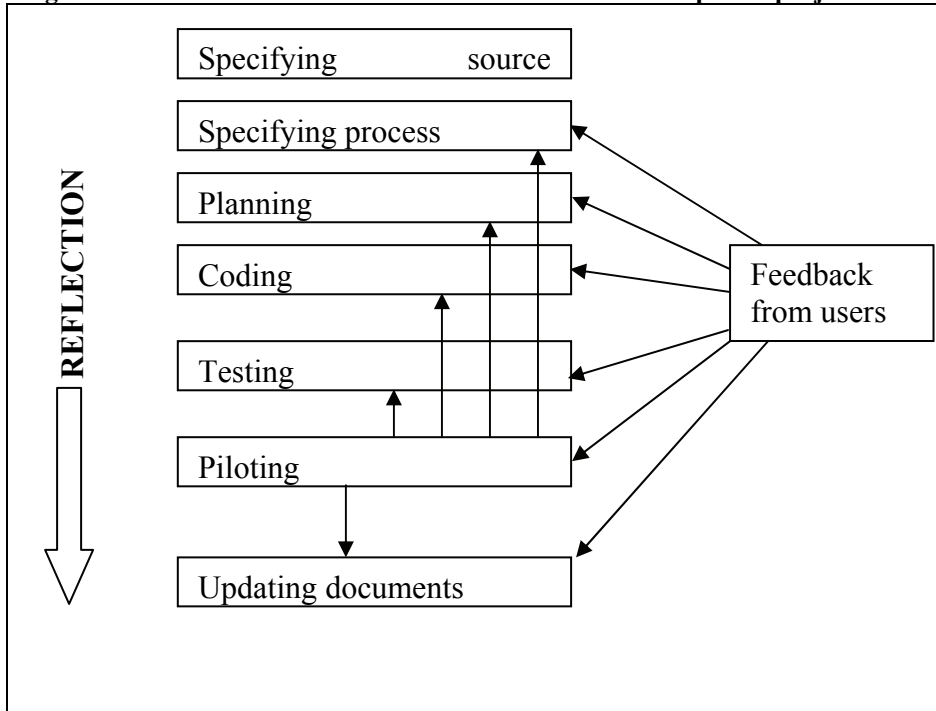


Due to difficulties in defining work processes, several changes and modifications were needed after the designed functionalities were coded and tested in the system. An interesting opinion concerned the cost and importance of conceivable faults in the information system: *“And in the background there is the thought that this eSystem is developed for us and that we are paying for it. If there are mistakes or if there are unsatisfactory decisions – it shouldn’t be any end of the world.”* (Email in May 2006).

Despite the active role of the users in this development project, the amount of suggested targets for development after careful designing and discussions increased up to 176 during the pilot. The number proved the difficulties to understand the effects of made changes in work processes or in database. Very often the conceivable effects were impossible to prefigure and they did not come visible until the information system was changed and tested in use. It also appeared difficult to figure out the relationships between suggested changes. The user supposed that her suggestion only influences that specific action but usually the influence was accumulated. A new risk was added to the risk list on February 2, 2006: *“New features are included in the system too late.”*

In addition, the changes that were made in the information system influenced also the documentation. However, to avoid overlapping work, the project manager did not want to update the documents before the information system was as ready as possible. That decision led to problems in completing the documentation. The situation was recorded in the project memorandum on November 27, 2006: *“Due to late accepted changes in eSystem the documents will not be completed in time.”*

Fig. 4. Influence of user feedback on functions in the development project.



Altogether 47 project meetings were held during the piloting phase. The users participated actively and they were able to give feedback whenever they had found something to say about the functionality of eSystem. Fig. 4 represents the influence of user feedback on the information system project. Due to the active involvement, the project was not stabled until at the very end of the project. The final endpoint was dictated by the schedule that stated the project to end on December 31, 2006.

The role of the project manager could be described as a facilitator between the users and the vendor. One of the most important tasks of the project manager was to ensure that the project would progress and that it would be completed in time. Following Schön (1983), her role could be characterised as a reflective conversationalist with a situation where she acted as both an agent and an experient. She used to send encouraging messages to the users: *“Really, you are an excellent information system developer and experimenter! It is splendid that you tested it so quickly and told about your experiences to all the others!”* (Email November 2006). The interaction was perceived mostly friendly and also the users sent actively emails to the project manager: *“To my mind, the gathering was very successful. Occasionally, the network was found slow but no rebelling was found there.”* (Email November 2005).

Despite negative experiences from her past (Halonen 2004a) the researcher felt the influence of users fruitful and supportive. The information system was evaluated by praising words by the officials: *“This report is an excellent addition compared to previous situation. This kind of information was not available when the mobility was managed decentralised.”* (Email in March 2005). Some of the officials used also the feedback form that was aimed to other users: *“At least in this issue we have done a good development work :)”* (Feedback October 6, 2006). The project work, too, was perceived as a positive experience: *“To my mind, this collaboration [in the project] has been really fruitful and interesting.”* (Email in December 2006).

Concluding discussion

This article reports the findings that were found in a research project. In the project, an inter-organisational information system called eSystem was developed and tested. The significant character in the project was that the users were involved in the project from its beginning, even before the project manager was invited to join the project. Inter-organisational information systems and their developments are studied and reported already earlier, but the active role of the organisations and users representing them has so far been under lesser attention.

The research approach is qualitative and subjective and it necessitates interpretation when analysing the findings. The findings propose that the development of information system should be more flexible compared to the theory that literature traditionally proposes. We argue that information system developments in real life seldom resemble any theory even if widely reported. Our information system project did not follow the classical life cycle described by Lucas (1985). On the contrary, the development process seemed occasionally go backwards. Furthermore, we argue that only flexible routines enable the users to be taken sufficiently into account.

In our case, the trust in interaction was perceived reciprocal in the project meeting and the several emails were sent between project participants. The natural and easy terms between people enable the fruitful interaction. The users were not afraid to express their opinions and wishes about the functionalities when discussed in the project meetings.

A special character in our project was the role of the project manager whose main task was to act as a facilitator in the project. The users were the main actors from the view of the output. In addition, the role of the vendor who did the actual coding can be seen as a hired employee. Following this, the users were not people who offered their experience. Instead, they were the primary actors in the project.

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Everyday Life – Domesticating The Invisible

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Abstract

The starting point for the following paper is the importance of the everyday for our understanding of what people do with the media. This claim is not new – what is new, however, is the pervasiveness of mediated environments in our everyday lives. The paper begins with a return to traditional theoretical thinking about the everyday, to remind us of some of the core arguments. Theorists used are Alfred Schütz (theorist of the everyday as such), Michel de Certeau (stress on strategy & tactics) and Walter Benjamin (methodological concerns, amongst others with mobile hyper-networks of meaning). In the second part the concern with the everyday within media research will be regarded and related to the outlined theories as well as to methodological questions (keywords are domestication and media ethnography). This again will lead to the third and final part, which outlines the necessity of a new theoretical and empirical focus on the everyday thanks to currently changing media environments. The paper will further be using a few examples from recent research on wireless media adoption processes in semi-public places.

The everyday¹

Everyday life has been at the heart of the concerns of media research for some time. Especially media research within a qualitative, cultural studies oriented tradition has focussed on this topic. Those interested in users and technologies have also concentrated on the everyday for quite a while now, since the everyday is where use – and hence also innovation – often takes place. Hand in hand with the interest in the everyday went methodological concerns. Because it is very difficult to grasp – and hence research – the unspeakable and/or unquestionable, the taken-for-granted, which the everyday is seen to represent. Thanks to this difficulty, lay understandings of the everyday are very often taken as the basis for research approaches. These lay understandings, however, tend to think the everyday in contrast to something else (e.g. in contrast to the extraordinary, the celebratory, the exciting, etc.). This thinking in contrasts is misleading insofar as it puts the emphasis onto something other than the everyday (i.e. its opposite), claiming that this is what is actually interesting. It also ignores the positive potential that the everyday contains. In fact the everyday is the one sphere of immediate agency, of consequence, the sphere of action for everyone. No matter what perspective one takes: the everyday is at its heart ambivalent – and extremely relevant if we want to understand (media) technologies, users and user innovations.

This paper begins with a return to traditional theoretical thinking about the everyday, to

¹ The following paper should be read as work-in-progress. This is the first attempt at combining different theoretical approaches to the everyday and the empirical research that has taken place thus far. The arguments need to be developed much further and the examples strengthened.

remind us of the core arguments and to see whether they offer anything that can be appropriate for understanding the just mentioned ambivalence a bit better. Theorists used are Alfred Schütz (a core theorist of the everyday as such), Michel de Certeau (for his stress on strategy & tactics) and Walter Benjamin (as the basis for a methodological concern with the 'trash' parts of the everyday and for his hint of a mobile hyper-network of meaning). This theoretical introduction will be followed by a second part, in which the everyday within media research will also be introduced (albeit briefly). Keywords here are domestication and media ethnography and their relation to the afore-introduced theories. This again will lead to the third and final part, which outlines the necessity of a new focus on the everyday in currently changing media environments. 'Mobile media', convergences and 'user-generated content' are only some of the challenges that both users as well as use researchers face at the moment. The everyday might be the one framework that still holds it all together – plus it offers some methodological answers as well. The paper will be using some examples from recent research on wireless media adoption processes in semi-public places. This research project is faced with a combination of questions and methodological concerns – and the outcomes thus far suggest the everyday as the one concept that offers most linking potential. Thus I will first offer a brief reference to how the everyday entered this sphere.

Example 1: Wireless every-day?

In my study on wireless use in semi-public places (by which I mean primarily cafes), I have encountered places where the slow, but definite 'intrusion' of media technologies in what used to be a relatively technology-free space (only relatively!) has become invisible and widely accepted. The everyday is most visible in the fact that the media technology is downplayed by all actors involved. Although it could be seen as quite an intrusion, it is to some extent ignored and to a great extent managed so that it begins to disappear into invisibility. It has been appropriated, i.e. domesticated, but not only by its users. The cafe owner and his staff have developed certain official rules to keep the beast at bay (e.g. certain places and certain times where and when it is not allowed to use the computer) plus they developed a certain attitude of slightly annoyed non-interest which underlines the idea of the cafe as being the more important part of the interaction. The other users behave in similar ways. They, too, ignore the computers (and their users) where- and whenever possible. Making them invisible seems to allow the routines and social interactions to continue 'as if nothing had happened'. But even the users themselves showed a tendency in the interviews to downplay the technology – especially by those using much of it. In particular, there a tendency to stress that they were visiting the cafe not especially because it had free wireless access. Most of the interviewees made sure to stress that they liked the cafe overall and that they sometimes came without a laptop and/or that they did not necessarily disappear after they had checked their mail or done whatever they needed to do. They tended to stress the social nature of the cafe and their interest and involvement therein (in contrast to the assumed un-social nature of the networked technology). There was one exception – Nick, 37, a U.S. American musician, who went specifically to this cafe in order to download quite a bit of stuff (he was sitting there with a list of things he wanted to download and systematically worked through this list). His interview was the shortest of them all – simply because he neither felt the need to explain himself nor did he engage much with the environment he was in. His approach was the most functionalistic of them all – and thus, interestingly, the least 'everyday-ish'. The others all spoke of their patterns of visiting the cafe in which the computer was only brought along to 'do that, too'. The more they were able to adapt to whatever was assumed to be the 'normal'

environment, i.e. the more the wireless use became invisible and 'everyday-ish', the better it seemed to be. There was, however, one exception to this tendency. This will be discussed in the end.

Part 1: Theories of the everyday

As Ben Highmore pointed out not too long ago: “The everyday doesn't have a form of attention that is proper to it” (2002: 161). Since the everyday is the basis for everything else, our constant reference point, the most enduring element of most lives, it is still astounding how little it is being researched. Theoretical approaches to the everyday are growing and have a solid and interesting base in traditional sociological theories. Their empirical counterparts, however, i.e. those trying to actually implement and/or challenge those theoretical concerns, are few and far in between. The same applies to media and communication research. Here, too, the everyday has become an often mentioned term, a framework used to frame research, but it is rarely defined or approached empirically in a direct matter. Hence it seems useful to return to the theoretical ideas and see what they have to offer for empirical research.

The 'lay' framework

The everyday is one of those terms that gets used quite often – but usually without definition. It is assumed that everyone knows what the everyday is – even within academic research thereof. And surely most of us have immediate associations with the term 'everyday'. Many might think of their daily routines – the way to work; the radio in the morning; the interaction with family members, friends and colleagues; the tiredness of the flow of things that need to be done; the supermarket around the corner. The same applies to everyday objects: washing powder, busses, toilet paper, etc. And all of these associations (and many others) are indeed related to concepts of the everyday. But first and foremost they are pre-conceptual: they are our daily experiences, framed by a dominant discourse around the idea of the everyday. The next level of abstraction is still very basic: here the everyday gets described as the mundane, the routine, the unescapable. Everyday life is here seen as the 'stuff that needs to be done by everyone routinely'. This usually includes food and shelter and work and such basic components of life. As long as they are recurring and potentially invisible thanks to their 'mundane' nature, they are considered to be part of the everyday. They are 'day to day'. The research project mentioned above underlines this point: the less visible, the more it is perceived to belong, to be unproblematic and thus accepted as part of the everyday.

The 'expert' framework

Not only does the everyday not have the right form of attention, as Highmore pointed out (see above), but “more than most sociological concepts 'everyday life' has proved exceedingly difficult to define” (Featherstone, 1995: 55). Hence there is not *one* sociological definition of the everyday. Instead, many 'experts' repeat the above-mentioned aspects such as routines, mundaneness, etc. Plus it is often claimed that the 'lay' person is definitely *the* expert concerning the everyday. The researcher is faced with the challenge to step outside of the everyday, to remove him- or herself from his or her own life: to step outside and to see it for what it is – although it is so difficult to see. Plus the researcher needs to discover what 'everydayness' is about (cf. Highmore, 2002: 1).

In the following theory-examples, the last two are particularly concerned with the relationship of the everyday to the oppression that can also be found there. The everyday is seen by both Benjamin and de Certeau as the site where this oppression can be challenged.² This challenge is always partial and not necessarily radical, but it is a starting point. Thus the everyday poses the question of agency of the user. Schütz' concern is even more 'basic' than that: he poses the question of how intersubjective interaction can and does take place – and declares this intersubjectivity as the basis for the whole social world. We will thus begin with these 'basics'.

Alfred Schütz

Alfred Schütz, an important sociologist within the German context, is seen as one of the founders of phenomenology and one of the most important theorists of the everyday. Outside of Germany, his work has not been as widely read and hence received, although he keeps popping up at diverse (and sometimes unexpected) places. His main contribution to the theorisation of the everyday – and hence his importance for communication and media studies – is his emphasis on human interactions, on intersubjectivity. One of his main claims is that these interactions form the basis for the social world overall (Schütz, 2003).

Schütz was – to begin with – a theorist only in his spare time. He had a day-job as a lawyer in the financial district and was writing his first book, which was published in 1932, in the evenings and on the weekends. In 1938 he emigrated to the US, where he subsequently got in touch with several well-known sociologists. Only from 1943, however, was he a guest lecturer at the New School for Social Research in New York, where he got a professorship in 1952.

Schütz began by asking how the societal co-existence is possible without the knowledge of the subjective sense that others relate their own actions to. He assumed that all actors use specific methods in their everyday lives. These enable us to assume an intersubjectively shared sense. All our knowledge is socially constructed and passed on in these interactions. This makes up the lifeworld, i.e. our everyday lives. We are born into this lifeworld and take it as a pre-given. The lifeworld is the non-scientific world of the immediately-accessible everyday experience, the world that is intersubjectively negotiated. It is the overall context of the life sphere, in which the world is made sense of. People partake in this through their everyday actions and their pre-scientific knowledge. This kind of knowledge is shared. It becomes knowledge simply through the shared assumption that it is knowledge (shared within a certain group). This leads Schütz to state that 'we' comes before 'I' (just certain things such as dreams and specific memories are only accessible to the individual), i.e. that intersubjectivity is key. Schütz also claims that the everyday is not usually questioned. However, while the lifeworld provides our framework, we can also change it. These changes though are often subtle. The question of agency and the relationship of the everyday to 'the rest' is already central here. Schütz, however, is not interested in the individual as such, but in his/her intersubjective communicative construction of the world.

The emphasis is therefore clearly on the *construction* of the everyday. It only appears stable because we make it so. We agree on certain assumptions and re-construct them every day by

² It is interesting to see that both these theorists use a rather poetic language to express their thoughts. And neither are necessarily 'typical' academics (nor is Schütz).

repeating these, passing them on, etc. There is no pre-given structure and stability. But there is the need for stability (Giddens' ontological security: we need to believe that the everyday will remain the same in the days to come). Hence the intersubjective agreements form the basis of the lifeworld and everyday life. Plus the everyday is there to pass these on.

In Schütz' work, the social environment is split into the immediately accessible (and hence most important for our understanding of the everyday), the wider environment and the environment that builds on the past. Schütz also stresses that an important part of the methods that deal with the intersubjectivity in everyday life is the concept of *type*. We tend to think of others (and they of us) as types (typical representatives of certain social roles) rather than individuals. This abstraction helps to react in – what appear to be – appropriate ways. Our experiences are always compared to the already existing ones and – if fitting – judged to be of the same type. This implies, according to Schütz, an idealisation of the congruence of the systems of relevance and an idealisation concerning the possibility to be able to exchange one opinion for another.

With this approach, Schütz contributes well to the theoretical foundation of our understanding of the lifeworld. Plus he emphasises intersubjectivity and hence the centrality of communication. But he does provide little translation into more empirical approaches to the everyday.³ Instead, he offers an idealtypical reconstruction. It would be useful to see an empirical layer added to his work. On the theoretical level, the sociology of the everyday, to which Schütz belongs, continues his work in focussing on everyday knowledge and the question of how those things we tend to do every day without questioning them come about, how we get to know them and apply them. For the purposes of this paper, however, the focus is on the more basic question of the everyday as such. Micheal de Certeau can also be seen to deal with the question of agency (of a specific sort) and the everyday. He offers views on *actions* that shape and change the everyday.

Michel de Certeau

“For what I really wish to work out is a science of singularity; that is to say, a science of the relationship that links everyday pursuits to particular circumstances.” (de Certeau, 1984: iv)

Michel de Certeau perceives the everyday to be somewhat hidden and hence difficult to capture. He thus takes the actual everyday as his starting point and – in a rather poetic manner – shows the particularity and singularity thereof – but not without also showing some general tendencies.

De Certeau was a Jesuit, a psychoanalyst, a ethnographer of the everyday and other things on top. His own movements in his life are mirrored by his terms (often metaphorical) with which he captures spatio-temporal activities as the basis of everyday activities (cf. Highmore, 2002: 145 ff.). The simple fact of us being in spatial proximity to others also leads him, too, to the importance of intersubjectivity. More importantly though, he 'judges' the everyday as potentially oppressive, but also exactly as (subtly) subversive. This is the most quoted aspect of de Certeau's work.

3 The ethnomethodologists attempted an empirical implementation of these theoretical approaches. This, however, goes beyond the scope of the current paper.

For de Certeau (and probably the other here mentioned authors as well) the everyday is *becoming* rather than *being*. It is the sphere of cultural reproduction (Lefebvre), but also a sphere for possible transformation (cf. Highmore, 2002). The everyday contains the possibility for carnival, for a revolt against that increasing discipline and the ready-made culture coming from 'above'. This not adapted to, but it itself is adopted to the everyday. However, resistance is not necessarily opposition – it can be both active *and* passive:

“On the one hand, there are slowly developing phenomena, latencies, delays that are piled up in the thick breadth of mentalities, evident things and social ritualizations, an opaque, stubborn life buried in everyday gestures that are at the same time both immediate and millenary. On the other hand, irruptions, deviations, that is, all these margins of an inventiveness from which future generations will successively draw their 'cultivated culture'.” (de Certeau, 1997: 137-138)

This form of resistance underlines that power is differentiated and multiple. It adds to the multiplicity and both preserves and challenges it. 'Microinventions' is one term de Certeau uses to describe the resistance and the idea of 'learning to make choices'. Resistance can mean conservatism in times where revolutionary aspects are generally praised as the only way forward, i.e. resistance is not a clear line of thought. The resistance of the weak he calls 'tactics'. These work against the 'strategies' of the powerful. Tactics are not counter-strategies, but act within the existing strategies. They are secrets, bluffs, disguises, etc. A much quoted example is 'la perruque', i.e. using company time or tools for private matters (de Certeau, 1984: 25). Another much quoted reference is his reference to the walking in the city. This, too, can be a tactic, moving in unanticipated ways. It underlines that ultimately, de Certeau refuses the logic of the subject in his 'science of the singular'. He does not look at actors, but at actions. This differentiates him quite clearly from other theorists. It also poses the obvious question of how this is supposed to work.

The assumed method is to find the marks that have been left (like Benjamin). One is to archive the everyday and 'everyday' the archive (Highmore, 2002: 169). Again, in parallel to Benjamin (see below), one should use a lot of different sources. For the present, this is less clear. This is also one of the criticisms that has been raised: de Certeau's analysis is not necessarily grounded in a sociological analysis, but presents instead simply a generalised account of transgression. This reference to transgression, however, is exactly what singles him out. His work helps to think through ideas of acceptance and resistance within the everyday. As noted above, this is resistance, but not usually opposition. It changes the everyday via the everyday – and ultimately it changes more than the everyday. But the changes are usually invisible, untraceable – at least on the surface. Walter Benjamin, on the other hand, begins to offer a more concrete 'methodology' to uncover the invisible.

Walter Benjamin

Similar to Michel de Certeau, Walter Benjamin deals poetically with the ephemeral of the everyday. Especially in his unfinished *Arcades Project* (1999), the philosopher and cultural theorist Benjamin – without necessarily naming it as such – provided a method for the analysis of the everyday. What he did – in exile in France, to a great extent in the National French Library (Bibliothèque Nationale) in Paris – was to collect and arrange the pre-history of modernity. He did this through looking at the remains of what he considered to be everyday life. These were the usually ignored parts of culture: the 'garbage' of bygone times.

They were images, pamphlets, brochures, letters, books, etc. What he was aiming at is not dissimilar to de Certeau (although ultimately more radical): he pursued the idea that an awakening would be possible, an awakening from the horrific ties of capitalist suppression, which was both to be seen in everyday life, but also challenged. His approach to this challenge is rather different to de Certeau though: Benjamin hopes to change things through his writings and the method he developed therein: “Method of this project: literary montage. I need say nothing. Only show. I won't filch anything of value or appropriate any ingenious turns of phrae. Only the trivia, the trash – which I don't want to inventory, but simply allow it to come into its own in the only way possible: by putting it to use.” (Benjamin, 1999: 460)

Benjamin hopes to archive the bygone everyday life of modernity through dialectical images: new and old materials collide. This juxtaposition of trivia helps to see the 'true image', the true face of capitalism. Through the the analysis of the small parts, he aims at detecting the total event. Benjamin's is both an analysis of the invisible – since taken-for-granted – aspects of the everyday as well as an analysis of the seemingly opposite: the new, the unexpected. This is what the everyday is usually not. But Benjamin shows that a lot of what was the everyday of modernity was a reaction to the new. One of the reasons for his (and other people's) interest in modernity is exactly this disturbance of the routine. Nothing was what it seemed any more, everything was turned upside down (“All that is solid melts into air”). This 'shock' had to be dealt with. And the shock was based to a great extent on the ephemeral nature of the new everyday. At the same time, the everyday began to be much more routinized and structured, pressed into pre-given forms – thanks to the industrialisation and such things. This was both the disturbance, but also the reaction thereto. This tension is what Benjamin's focus clearly shows.

Benjamin also showed how those traces of the everyday are like hyperlinks – traces of other everyday parts as well as of other kinds of references. What he thereby also provided was an early hypertext – multiple forms of texts that form – through references and linkages amongst each other and through the sorting of them into specific sections and sub-sections – a network of ideas and words. This is a useful reference when thinking about the quality of new media and its cultural implications. It also shows yet another perspective on the everyday.

But as Highmore rightly states: “Situating the work of Walter Benjamin in a tradition for theorizing the everyday is not without its problems” (Highmore, 2002: 60). Benjamin was concerned with the everyday less on an explicit theoretical level (i.e. how do we define and differentiate the term) rather than on a phenomenological and poetic level. He showed the close relationship between the everyday and human thinking, consciousness and behaviour, social relations and structures – and thus he made the everyday theoretical.

As can be seen from Benjamin's and other theories of the everyday, they often turn to modernity as their reference point and/or remain rather abstract. Even Benjamin, who immersed himself in the 'trash' of 19th century everydayness, remains aloof (potentially more so than the others). Then how is this to be translated into questions and frameworks that are useful for an analysis of the everyday today? How do these theories help us understand the future of the broadband society, both theoretically and empirically?

One concept that helps to understand current trends in everyday life is mediatisation. Next to globalisation, mobility/mobilisation, localisation, popularisation and other such terms (which are all useful in describing different, but related phenomena), mediatisation is used to identify

the growing presence of media in our everyday lives. This development is a quantitative one (more media, more time spent with media, more places suffused with media), but it is also a qualitative one. Not only are there more kinds of media, on offer all the time and in more and more places, but they have often reached a state of ubiquity, of unquestioned presence. Media have become a crucial actor in the construction of social reality – by they only co-construct together with the other everyday actors, i.e. everyone. This reminds us on the one hand of one of the qualities of the everyday, i.e. its invisibility. On the other hand, it questions the assumed nature and structure of the everyday, because it changes it. It is hence useful to re-read (albeit only briefly) some of the work of media use in everyday life.

Part 2: The everyday within media research

“Understanding media means remembering that the familiar is not necessarily the known, and must therefore first be made strange.” (Couldry, 2003:1)

In media studies, the user has traditionally been part of the audience. Audiences have seen several shifts in their theoretical definitions. The most well-known and repeatedly discussed differentiation has taken place between the duped, manipulated audience on the one hand and the active audience on the other. Both these categorisations played primarily on the content-level, i.e. the audience was seen to unquestionably adopt the given messages in one concept (which expresses a rather specific assumed role of the media) or the audience was seen to create its own interpretations of media texts in the other concept. Eventually, media studies came to see that content itself was not all when we want to understand the complex relationship between media and everyday life. Nowadays elaborate research goes into deciphering the processes that feed into the audience's interpretations of diverse media content. Constructivist approaches have begun to prevail, assuming that viewers do not simply adopt, but appropriate and use the media as one of their resources to assure them of their everyday lives and to construct the social world. Communication patterns around media content, for example, were researched in media appropriation approaches. It turned out that social networks were extremely important in the processes of integrating media into everyday life. This applies to both a content as well as a use aspect. The content level was, for example, researched via the communicative appropriation of media content approaches. They looked the conversations that people had during and after the consumption of media content (particularly television). They were able to show how important these conversations were in the build-up of specific assessments concerning the specific media content, but also identities and lifeworld assumptions in general.

Media use, on the other hand, was researched more particularly in the domestication field. This was an approach within media and communication studies, but also with the sociology of technologies, which focussed more on the routines and behaviours in everyday life. This included the actual acquisition of the specific medium, the placement thereof within the domestic environment, the gradual integration (or rejection) into established routines of everyday life and the subsequent communication of this media use to the outside world. The domestication approach has been broadened and changed in the years after its initial conception to potentially include other than domestic environments, to focus on the appropriation processes, to include new media, etc. (cf. Berker et al., 2006). The everyday, however, was always present through the focus on social relationships, routines and all other 'banalities' in and around media use. It was a focus even in as far as it at times began to

'forget' media content. The media as object were an important, albeit also problematic focus. Nonetheless, this approach is rather important when we think about media in everyday life research. It definitely helped to show how interwoven these two concepts are.

Methodologically, the domestication approach (and similar approaches around it) claimed to be using ethnographic research methods. There has been an ongoing debate ever since, whether these methods – primarily repeated in-depth qualitative interviews, time-use-diaries, drawings of the media environments, etc. – do actually count as 'ethnographic' or whether they were simply 'qualitative'. Despite these questions the methods involved (and especially their detailed discussion and reflection in the beginning) hint at the necessity to find ways of researching something over a longer period of time (i.e. at least with repeated interviews) and to take time to engage with the people in question. It also seemed to work well to interview both individually and in the group (i.e. the family or other relevant social groups). The everyday has so many aspects that it appears important to try to access it via as many research channels as possible.

If we now return to the theoretical beginning, other emphases can be added. First of all Schütz helps to focus what is already present – but could be researched even further: the social networks, i.e. the intersubjective co-construction of our social reality. Network research has gained increasing attention in the last few years anyhow. Hence methodological thinking in this area has also had interesting additions and new impulses. These could be intergrated into future research in this field. Secondly, de Certeau's hints are a bit more difficult to 'translate'. They point to the meta-analysis than simply methodological questions. They could, however, underline that the 'top-down' strategies should not be forgotten when we research the nitty-gritty of microscopic everyday use of media. There still are power structures and similar 'features' to be dealt with when thinking about the media. The 'resistances' can only be thought when the 'top-down' is also regarded. Thirdly, Benjamin's version of the 'nitty-gritty' serves as a reminder not to rely on people's accounts of their own behaviour only. The scraps and pieces that can be found everywhere are traces of the everyday that need to be included in the analysis as well. Maybe they, too, can be read as hypertexts that underline networks of yet a different, i.e. a content-side.

Part 3: Changing media environments and examples from the wireless worlds

To state that our environment overall and media environments in particular are changing is to state the obvious – and it is also something that is not entirely new anymore. However, its importance has not disappeared. The growing mediatisation implies the question of what everyday life today looks like through and with the media. If media environments are changing, i.e. if we, for example, use our computers in public places (such as trains), conduct 'private' phone conversations more or less everywhere, watch the World Cup in public viewing areas, etc., then our media consumption changes – but those places and social interactions in those places change as well. On top of this, media 'content' is changing, too. Media are converging and 'user-generated content' is somewhat different to other content (at least in principle it asks users to contribute). All this is a challenge for media researchers, not just because their object is changing in front of their eyes, but also because their methods tend to be inadequate. What does not simply change even so is the everyday – at least as an idea that structures people's lives (and thus researchers' interest). There is still an everyday, even when it has – maybe – changed structurally and content-wise.

My project on the use of wireless computer use in cafes was – to begin with – a domestication project of the 'domestication 2.0' type, i.e. one that regarded primarily the adoption of media technologies into everyday life rather than the process of 'bringing technology home' that was the focus of the early domestication work. Domestication 2.0 was researched via traditional media ethnographic research that has the user as its main focus, i.e. observation were conducted over some time and then interviews were held with a number of people. This was embedded in readings about new media use and changes of place, of perception, etc. What remained relatively vague was the nature of the everyday within the project although it clearly had the everyday as a focus. One aspect that was striking, as mentioned in the beginning, was how much the interviewees tried to downplay the nature of their mediated behaviour within the cafe. Underlying this seemed to be an assumption that a cafe was not supposed to be taken over by work. And although not all the actions performed with the computer in the cafe were clearly work-related, its presence alone had to be excused, it seemed. Hence two versions of the everyday (work vs. pleasure) collided here. However, there was also the exception: whenever the technology did not work, when it did not remain invisible, but became unworkable, then it also became a chance for new communicative encounters. Exactly when it broke out of the everydayness, it became a chance for the new, albeit a new that was not directly related to its intended functions. Whenever the technology did not work, people started to communicate about their machines, about wireless access as such, about themselves. Thus the machine became the actor that allowed the resistance.

The usual methods and approaches do not suffice here any more. Neither is it enough to observe and talk to people. Instead, more diverse access to both actions and content would be useful. The mediated environment needs a holistic approach. This might mean, very concretely, that such environments can only be studied and understood when one works in teams. The more 'invisible' the technology becomes, the more effort is necessary to make it visible in our research.

Conclusion

We can – once again – take several points from the theories summarised in the beginning:

a) the everyday is primarily intersubjective. Hence it is important to research the individual as a networked social being. Plus Schütz draws our attention to the importance of the immediately accessible world – the lifeworld that is actually at our disposal rather than that which is further removed. The here promoted idea is that of the *networked everyday* as a focus. This builds on, but extends, Barry Wellman and his colleagues' notion of networked individualism (Wellman, Boase & Chen, 2002). This concept underlined the current ambivalence between tendencies towards an increasing individualisation that nonetheless go together with tendencies towards increasing networking. They show that this is in fact not a contradiction, but that these are tendencies that belong together. The networked everyday also underlines that the intersubjective nature of our construction of the world has not changed, but that some of the co-constructions are now taking place in mediated ways. Most of this, however, is invisible and needs to be uncovered. The emphasis is hence on the well-known relationship between structure and agency. Networks – as dynamic as they are in principle – are here suggested to be the structuring aspects, the stability. Based on these, agency can (and does) take place in the everyday, the stable contingency.

b) While the network and intersubjectivity are one focus, a more concrete way of implementing this could be to take up de Certeau's focus on actions and not always actors. The how still needs to be thought through, but as a focus, it is interesting. It, too, can serve to

show different levels of networking and the networked nature of both things and people.

c) Additionally, we have seen that the everyday presents a power-struggle. There are strategies (we could call them capitalist, but this could be other frameworks, too), i.e. the mechanisms from above that attempt to pre-structure the everyday. These range from the discourses surrounding the everyday (certain things are supposed to happen in the everyday) to actual structuring mechanisms (times and places that only 'allow' certain actions – the cafe is a good example for this).

d) In our analysis of the everyday, we should also not neglect the small, seemingly unnecessary bits and pieces, the things. Cultural studies and other academic disciplines have, for some time now, already drawn our attention to these details. Yet the depth that Benjamin's analysis offers (probably in combination with other approaches) points to the potential usefulness of his dialectical method of combining juxtaposing bits of 'trash' and letting that combination point to something else.

Next to ethnographic methods, i.e. observations and qualitative interviews, we hence need to find ways to document several different kinds of networking activities. Plus we should also include the trash of the everyday and actions rather than only actors. Theoretical aspects that have not lost their importance are intersubjectivity and resistance. All of these aspects are part of the everyday. And they have not fundamentally changed. The everyday environments, however, are changing. The process is slow and the 'resistance' looms large (since the already known world cannot simply change), but once one uncovers the invisible, more can be seen (and heard) than originally anticipated.

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Evolution Of A Services With ICT : Case Of The Remote Assistance Device For Elderly People.

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Abstract

This research deals with the general problem of the social insertion of services with ICT. It takes the case of the remote assistance device to keep elderly and dependant people at home. Between the designers and the end-users of these systems, suppliers and in particular the listening stations (emergency stations, fire brigades) shape "pattern uses" and are part of the collective perception in the widespread use of these devices. This perception is structured differently in accordance with the transformation of work that these service providers find appropriate or not.

On the one hand, we will show how only a few actors can communicate about their perception, and shape « pattern uses ». On the other hand, we will show the different patterns of behaviour by elderly people using ICT services. Finally, we will show how new actors are involved by offering a wide range of ICT services and uses that elderly people are looking for.

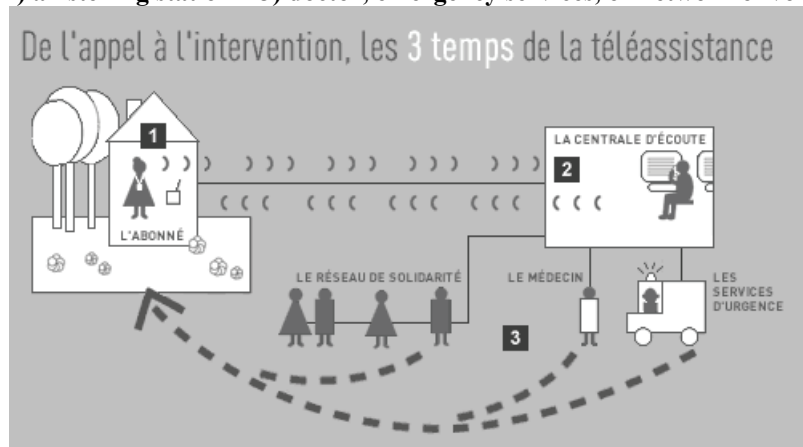
What is the remote assistance device for elderly people?

During the 1980's, given the inescapable ageing of the population, the various French *départements* began investing in remote assistance devices. This stemmed from public initiatives implemented as a direct result of a social policy to encourage keeping the elderly at home.

The elderly would wear a medallion or a bracelet. When activated (1), the elderly person would be able to speak to a remote assistance operator at a listening station (2), who would then evaluate the nature of the call and contact someone if necessary (3). Remote assistance appeared in this way as the first real piece of "ageing technology", that is to say technology especially designed in response to the specific needs of the elderly (Jobert, 1993).

From the call to arrival of help, the 3 steps in remote assistance :

1) a subscriber – 2) a listening station – 3) doctor, emergency services, or network of volunteers



The sociology of sciences and techniques has taught us to consider all technological innovation as a complex interrelationship between techniques and humans. From the outset of remote assistance design, a representation of the end-user was found within the technical object : destined to keep elderly and dependant people at home. Remote assistance was, from the start, associated with a medical approach to dependence. The represented end-user is a person struggling with bone and joint problems associated with ageing such as restricted movement and the risk of a fall resulting in de-socialization. Indeed, the most often quoted scenario by everyone concerned with this problem, used to convince authorities of the usefulness of this device, is the case of an elderly person who has been living alone since the death of his/her spouse and who falls breaking the neck of his/her femur and cannot get up to call for outside help. By activating his/her medallion, this elderly person can call for life-saving help !

In the case of a remote assistance device, the implementation of a remote service and its analysis bring up an organisational problem.

Its implementation pre-supposes :

- identifying the various players intervening in the given field
- analysing the methods which led them to invest in a remote service
- analysing the changes which will take place within their profession as a result
- analysing the representations which will result from the supply and demand which they are supposed to manage
- analysing the initial uses

In other words, one must know who will use this technical device, why they have decided to use it, and how they will react when using the device for initially unintended purposes ?

Within the context of implementing policies concerning ageing and transferring power from Paris to the French provinces, French *départements* will create a policy through a series of measures supporting keeping the elderly at home, one of which being remote assistance. In this scenario, French *départements* will take charge of financing a listening station and the towns within a given *département* will become subscribers. They will use the existing listening stations which are already managed by French *départements* : those run by fire brigades (SDIS) or by emergency medical services (SAMU).

France did not opt for a single emergency phone number as is the case in most European countries. The fire brigades (18) provide most of the initial emergency services for the public at large. The job of the SAMU (15) is to provide emergency medical services only. The division of emergency services between the SAMU and the fire brigades, between those dressed in white and those in red, is sometimes presented as a very clear division... In reality, these emergency specialists often have to work together.

When confronted with the difficulty of evaluating the emergency needs of the elderly deemed dependant, both quantitatively and qualitatively, various elected officials have historically made choices which have mostly been influenced by political party lines.

Listening stations

The SAMU : emergency medical services

In one of the *départements* studied, the elected official in charge of ageing policies is a doctor. In this way, he knows how to convince the SAMU to « expand into the social realm » and to get the listening stations to incorporate the remote assistance services for dependant elderly people. Nevertheless, management at the SAMU must deal with the resistance of certain doctors who do not want to be held responsible for this type of call :

« ... it wasn't easy at the beginning as certain members of the medical profession were sceptical about a call center for the elderly. There were some who categorised them as " pee pee-poo pooh " calls. But I stood my ground. I thought we were moving in the right direction, that it was the next logical step since the creation of the SAMU and the AMU » (governing body of the SAMU).

When confronted with the doctors' refusals, management chose from the very start to recruit people who were not members of the medical profession to respond to calls from the elderly. These people were chosen for their ability to dialogue with elderly people.

Moreover, lessons from the past indicated that the majority of calls would be those concerning conviviality and comfort (the need to speak to someone/ needs of everyday life).

Indeed, the first service provided by the center was the SAMU, that is sending help to people who needed to be hospitalised so that they receive emergency care and to guarantee their transfer to hospital services in the best conditions possible. A single phone number was created (15) and the service was immediately very successful. However, this service was very rapidly confronted with a problem : numerous calls which did not concern the SAMU : often concerning the flu or minor problems and not serious injuries. To respond to the other minor medical problems, the AMU was created, that is to say a network of doctors in towns (GP's and emergency specialists), who would be called to care for people who had been in accidents or were ill and who didn't need to be sent to hospital.

It is certain that the SAMU and the AMU only concerned themselves with the medical field, but there was still a wide range of cases to handle from extreme emergencies (life or death) to minor emergencies . The person running the SAMU then decided to create a remote assistance service to handle very minor emergencies called Biotel.

The documents which accompany the presentation of Biotel indicate a service which is still concerned with safety and assistance. Nevertheless, the documents are divided into three types of reasons for calling- uses of Biotel by the elderly : emergency situations, medical problems and calls for minor problems. Concerning this last category, the French

départements have included the idea of services to comfort someone who lives in a remote area of the *département* or to reach out to those who are feeling lonely : “ Do you need to talk to someone ? Do you need some advice about a certain problem you have ? The operator will respond in all these types of cases”.

Offering as a complementary service the possibility of « a simple conversation » associated with remote assistance, Biotel is a shadow organisation of the SAMU (15) which offers, via remote assistance, a service which takes calls which do not concern medical emergencies.

As soon as remote assistance was set up, the volume of these calls deemed convivial was so high that an attempt at categorising these calls was carried out by the SAMU. In this way, these calls have been divided into two categories :

- the need for a dialogue or an exchange in cases of loneliness
- simple needs of everyday life

«What is shocking is the loneliness which the elderly feel. They mostly need someone to talk to. It is striking as we notice that the number of calls changes depending on the season. We get more calls during the winter months, from November to February, than during the other periods in the year... The discussions that one has with them are relationships made up of numerous exchanges based on a little of everything or nothing at all, but which nevertheless concern the needs of everyday life... » (remote assistance operator, SAMU).

These conversations, which highlight the isolation and the need the elderly have to talk, have been corroborated by statistics. As soon as Biotel was set up, in 1987, calls concerning conviviality, necessitating emergency assistance or not, were extremely numerous.

From 1987 to 2001, the SAMU received 376 158 calls, of which 90% did not necessitate emergency assistance. Among that 90%, 74% were convivial calls or « wrong numbers ». Among the calls necessitating emergency assistance, in 60% of cases, the person's sponsor visited them. The main cause for calls necessitating emergency assistance was a fall, the second cause was the need to speak to someone.

«The need for conviviality has been increasing steadily every year. Subscribers have understood by now that Biotel is not exclusively a medical service but can also offer them something else : certain subscribers ask us to send them someone to pick up their medicine, or open a window, or give them their medication, etc.» (remote assistance operator).

In this way, by announcing publicly that remote assistance is also a service for conviviality, and by recruiting people whose very job includes this skill (ability to create a convivial exchange with the elderly), has opened a crack into which Biotel subscribers have rushed in to fill. Indeed, these very elderly people, often isolated, find at Biotel a much-coveted sociable place.

That is why today the SAMU handles 3 types of calls : very urgent calls which necessitate sending a medically-equipped ambulance (SAMU, urgent calls which necessitate sending a GP or a *départemental* medical specialist (AMU), and calls from elderly subscribers to Biotel, a remote assistance service.

Fire brigades : emergency professionals

In another *département*, the choice was made to create a hybrid alert/illness service which equips hospitals and clinics with the fire brigade's new alarm system (18).

« We were in an emerging market, the political decision-makers supported us and the fire brigade were setting up a management center for fire alarms with the ability to receive calls from the entire département but what one didn't know was that the département and the fire brigade at that time were the same person ». (Manager for a fire brigade listening station)

In July 1989, the *département* informed all the Social Assistance Service heads in all the communities in the *département* that it had " implemented a REMOTE ALARM system destined for the elderly and handicapped in order to keep them at home ". The day-to-day running of its operations was handed over to the fire brigade. Written agreements concerning subscriptions were signed between the social assistance services and the fire brigade. At that time, however, the market was really very difficult to grasp ; their objective at the start was for 1 000 to 1 200 subscribers for the entire *département*.

This configuration of players offering remote assistance services putting the fire brigade at the center of operations was at that time the most widespread set-up in France. It was the result of two jointly implemented policies organised by French *départements* : on the one hand, the reform and modernisation of fire brigade assistance centers and on the other hand, the application of laws concerning social assistance policies for the elderly.

As Rochette and Marchandet have already pointed out concerning remote security operations, remote assistance is not a replacement operator or an extra operator in a production line of services, it is a production line which incorporates new factors and in so doing redistributes the positions and relative weighting of each one of these previous elements. This poses a problem because the final set-up of the service will to a large extent be determined by the know-how held by the various professions to the detriment of the initial demands. (Rochette, Marchandet, 1998).

As we have seen above, in a large number of *départements*, the fire brigades were handed the responsibility of running the remote assistance services when these fire brigades were "restructured". The hybrid approach, from a technical point of view, did not come up against any major difficulties but from a social point of view, this approach was more problematic : at the start, when faced with the difficulty of evaluating both quantitative and qualitative needs, only the record of health-related emergencies was associated with the use of remote assistance. But, as the years went by, this offer created a demand --- that of alleviating social problems --- which placed the fire brigade in a very ambiguous situation, in a role that they did not agree with and one which forced them to intervene in situations that did not concern them. Over a fifteen year period, the logic employed (Perriault, 1989) concerning remote assistance moved further and further away from the fire brigade's initial duty and the tasks Inherent in this profession.

Despite their disapproval, the fire brigade cannot choose to ignore an emergency call. Accordingly, as soon as an elderly person activates his/her medallion, a fireman on duty at the listening station sees the information corresponding to this person on his/her screen (name, age, health problems, hearing problems, etc.) and must consequently respond :

« Hello, Mrs. Durand, is everything alright ?... »

Whatever the nature of the situation, whether it be urgent or not, the fire brigade responds very professionally to the needs of “granny”. They carry out their work meticulously and only hang up when they are sure that the caller is safe and sound. Accordingly, the elderly, from their point of view, are very happy with the service rendered by the fire brigade :

« listen here, I do not like to hear anyone criticising the fire brigade, because they are extremely kind and always there to help you, if something is bothering you. It is not a profession that I would blame for anything. No, indeed... » (Mrs. G., 89 years old)

It is another story altogether when it comes to supplying the local authorities with a vision of service rendered as the fire brigade must then refer to the classification of calls used by 18. These figures supplied by the station are then published in an annual report. By supplying in this way the statistics based on the fire brigade’s initial duty – health-related emergency calls from the city streets – the incompatibility of remote assistance services when compared with this initial duty is strikingly clear. The remote assistance activity is measured using the number of subscribers and the number of calls. For the fire brigade, these calls are alarms which are divided into two categories : « justified distress calls » which make up 10% of calls, and « unjustified distress calls », which make up the remaining 90%.

Table 1. Categories of distress calls.

Month	Justified calls			Unjustified calls			Total
	Falls/Illnesses	Services (toilet, ...)	Other	Errors	Attempts	Other	
January	82	65	72	670	438	502	1 829
February	83	54	61	619	379	633	1 829
...
December	105	80	108	880	520	1 031	2 724
TOTAL	1 048	585	955	9 463	5 580	8 679	26 310

Annual summary of remote distress calls supplied by the fire brigade’s listening station

For the fire brigade, “justified” calls are those which correspond to a real health-related emergency and which necessitate someone coming to help them. The report supplied a table summarising what was done in response to justified calls; Accordingly, among the calls considered “justified“, family, friends, neighbours living nearby intervene in 40% of cases, and the fire brigade in 10% of cases.

Table 2. Responses to remote distress calls

Month	Family, Friends, Neighbours	Doctor	Fire truck	Ambulance	Police	Other	Total
January	109	10	18	8	2	83	230
February	74	6	22	2	3	85	192
March	101	8	24	4		74	211
April	92	4	16	5	1	95	213
May	103	9	33	8		85	238
June	96	4	23	6	1	103	233
July	48	4	19	6	1	111	189
August	62	5	26	3		51	147
September	114	7	17	3	2	116	259
October	127	5	18	2		75	227
November	127	10	24	8	3	74	246
December	117	7	22	5	2	117	270
Total	1 170	79	262	60	15	1 069	2 655

These figures associated with uses of remote assistance are the only ones known and are widely supported by professionals in the field of gerontology. The rate of 90% of “unjustified distress calls“ is widely used and contributes to a very negative representation of this service.

A large number of them begin their evaluation of the remote distress call service by saying : “it doesn’t work “. Beyond the official figures, those in charge of the fire brigade listening station (18) emphasise the incompatibility between the fire brigade’s duty and the requests generated by the remote assistance service.

« One must acknowledge that the fire brigade’s duty is not of a social nature, which is the very problem. That is the work of social assistance services. We do not have a policy to keep the elderly at home. That was a decision made by the département which asked the fire brigade to take the responsibility for distress calls in partnership with local communities. That is what is called a political request because before, there was nothing.[...] What we do best is follow up on a distress call. The problem for us is all the other unjustified calls. It is all these calls ; the granny who needs to hear someone’s voice, or to be comforted, or to make sure that there is someone at the other end of their medallion but these problems are not our concern. The problem is all that and, of course, people’s distress, those who need moral support. ” (Fire brigade chief at a listening station)

In other words, the fire brigade accepts to respond and provide support for emergency callers in cases that comply with the initial intentions of those who designed the service --- such as an elderly person who, after a fall, breaks the neck of his/her femur --- because this emergency caller has an urgent medical need. On the other hand, when other emergency callers with other age-related problems call, they are a lot more reticent to respond :

« and that is a problem because when we have to deal with someone’s grandmother because at 1 o’clock in the morning, she calls to say that she’s cold. It is not the fire brigade’s job to tuck her in at night. And then when you contact her sponsors, one of them doesn’t respond, and when calling a second, you get an answering machine, and the third’s phone number has been changed, what does one do ? and then you get a call from someone’s granny who is crying and you don’t know how to react, and when there is a fire and we have to get some help from a fire brigade in another community because your firemen have gone to tuck in the previous caller...ok...the fire brigade has a role and the one we were initially entrusted with is not... ” (Fire brigade chief at a listening station)

Innovation to better serve the public

Without further developing the role of all the players who participate in keeping the elderly at home, we notice that each player ends up either validating or invalidating, given their approach to these services by virtue of their professional duties, the various players who “lend an ear “ to the elderly. The uses made of these services must therefore comply with these professional duties. For example, the conversations tolerated by Biotel would not be tolerated by listening stations run by fire brigades. All of the players with a social role in these services influence its representation which leads to validating the appropriate and inappropriate uses of this remote assistance service.

However, remote assistance services, by giving very elderly people the chance to speak when they feel the need to, has brought to light the extreme loneliness these people feel when they are confronted with restricted mobility.

Within the framework of policies for the elderly, the objective of keeping them at home remains in France the dominant model. The foreseeable ageing of the French population has already given rise to more and more people subscribing to this type of service. Currently, new

players are continually innovating by offering remote assistance services which are advertised as a response to this social distress.

« You feel the need to speak to someone, you feel lonely, you are experiencing anxiety, you have been stricken with an illness, our remote assistance operators are standing by from Monday to Friday. All year round, this service guarantees a real presence at your side ».
(Brochure presenting a remote assistance service appearing in 2006)

Developments in what is available have created innovations in various aspects :
technical, professional and organisational.

Technical innovations

A large number of calls are considered unintentional and often the elderly mention the fact that the medallion gets accidentally caught on something. Moreover, this medallion is often considered to be too visible and stigmatising for the dependent person, the downside of ageing. Manufacturers have looked into offering something a bit more discreet. Consequently, nowadays, the majority of remote assistance services offer a medallion and/or a watch which, instead of indicating the time, has a push button. In the same way, to respond to calls for convivial reasons, the stand which is placed near the telephone now has a push button to directly contact the listening station without even having to wear a medallion or a watch. Experiments are currently taking place with video teleconferencing (sound and picture) via broadband transmission lines.



Professional innovations

Listening stations now offer services devoted to lending a sympathetic ear to the very elderly. With this goal in mind, listening stations are recruiting and training remote operators regarding the problems linked to very old age. These operators must know how to both respond to emergency calls, to health problems, as well as give information about their services offered to the very elderly, and try to respond to these people's social distress and low spirits. This demands knowledge of psychology. More and more listening stations employ a psychologist.

The first statistics on the nature of the calls received reveals the difficulty in determining meaningful categories for calls. The significant number of calls considered “unintentional” can be understood in different ways : In the field of remote security operations, “if numerous professionals declare it to be the number one problem in the field, others are convinced that in fact there are no “false “alarms because all alarms indicate some sort of defect in the

“security infrastructure” and in that capacity they have a significant role to play “. (Rochette and Marchandet, 1998).

That is why, today, *départements*, which finance to a large extent these services within the framework of their policy for the elderly, demand a better understanding of the nature of these calls. Professionals try to define new indicators concerning their nature and the real need which is sometimes hidden in the background. *Départements* define three types of calls : repetitive falls, people who have forgotten that they have just called, and calls which clearly indicate an underlying problem, leading to informing the elderly person and social workers about the necessity to take another look at the conditions in which this person is kept at home. When confronted with the difficulty of identifying the needs of these elderly people, certain listening stations offer to call the subscribers on a regular basis in order to detect any possible distress.

Organisational innovations

Listening stations, want to both become more professional and expand their services to all French *départements*. Currently, questions concerning co-ordination among the various players in the field of gerontology remain of the utmost importance. Listening stations are publishing more and more detailed information about the nature of these calls which is of special interest to the “ close ties “ of elderly people. However, these close ties, made up of both volunteer professionals (doctors, home care professionals, etc.) and family members, remain “ tailor-made“ to repeat the term used by a social worker. The question of communication among these listening stations and these close ties remains a real question today.

Conclusion

The relevance and the success of a remote assistance service depend on the ability or the willingness of service professionals not to limit themselves to a medical and rigid representation of ageing but, on the contrary, one that can respond to the diversity and the development of the various faces of ageing : momentary fatigue, isolation, confusion, etc. There still remain a large number of calls categorised as «unintentional», but there are several ways of understanding these “false alarms”.

Remote assistance by offering the possibility of calling a listening station generates a whole series of calls which can also become the source of information on the nature of the difficulties that the elderly experience, above and beyond any judgement concerning the calls themselves. Those who work in gerontology would like to be able to gain access to this information to decide on how to re-organize the mobilization of those close to the elderly or to decide once again from scratch on what kind of help the elderly really need to be available for them. The project of mobilizing remote assistance, as a tool for a better-adapted service catered to the needs and the context of an elderly person, is a relatively new approach which is part of “ the building of a lifelong project of home care “ and attempts thereby to respond to the diversity of faces of ageing. This approach is today acknowledged by certain social services, which can consequently become the relevant link to create, with the help of remote assistance, a social network of close ties for the elderly.

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Attractiveness and Responsiveness of Moblogs

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Abstract

The (r)evolution of personal and collective publishing offers new tools allowing the Internet users themselves to become content creators. Along with the personal typing in weblogs a new practice for communication has emerged in the form of snapping pictures and sharing them in the web. These virtual picture galleries constructed and updated right from the field with the help of a mobile device has become known as *moblogs*. In this paper we examine practical functions of moblogs as a space of self-presentation and intercommunication. Our methodology consists of web-ethnography that combines methods from ethnomethodology, conversation analysis and ethnography. The focus is on the participants - authors and visitors - and their actions and interactions. We also use two analytical notions: attractiveness and responsiveness to describe the functions of the moblogs and differences between them. As result of the study we present four part taxonomy of the different moblog functions and analyze further more detailed the participative processes of moblogs of each category. From the basis of our analysis we suggest as a conclusion that moblogs are used for storing, sharing, publishing and communicating with images, meanings and messages.

Keywords: Moblog, mobile blog, function, web communication, ethnomethodology

Introduction

The (r)evolution of personal and collective publishing offers new tools allowing the Internet users themselves to become content creators. The boom of virtual writing has created a whole network of blogs and blogging culture, a kind of a *blogosphere*, in which private people feel free to share their everyday narratives, different communities to construct data basis around topics of their interest or even corporations to promote their business, products and services (see Scoble and Israel 2006). A couple of years ago the number of weblogs was estimated to be more than a half a million (Blood 2002). Today blog census project, NITLE (<http://www.blogcensus.net/>) records nearly three million weblogs. Technorati blog index (<http://technorati.com/>) estimates the amount of the blogs to be even greater, about 71 million. Along with the personal typing in weblogs (abbreviated generally to “blogs”), a new practice

for communication has emerged in the form of snapping pictures and sharing them in the web. These virtual picture galleries are produced both with digital cameras and different kinds of portable devices, which provide more direct modes for personal and collective publishing and communication right from scene. The latter form of sharing and communicating with pictures and texts has come to be known as *moblogs* and the practice of producing one as *moblogging*. The concept of “Moblog” was first introduced by Justin Hall (2002) and Adam Greenfield in 2002 (http://www.v-2.org/displayArticle.php?article_num=182). Since then at least the terms “wireless blog”, “visual blog” and “photoblog” have been introduced. They all refer to a special kind of visualized blogging.

The moblog can be characterized as more or less regularly updated website in which chronological ordered content is posted primarily from cellular phone or other mobile device with wireless connection. Moblogs may be either private with one single author or collective with many authors who contribute to one moblog by sending their own pictures and adding text entries. The content of the moblog is by and large picture-based, although photos may be accompanied with text that may be either short descriptions or longer histories and narratives. The moblog contributions may vary from a personal type of snapshots with intimate diary entries to up to the minute professional photography and journalism. The recent development of mobile devices has made it possible to also add audio and video clips to the blog (see videoblogging e.g. <http://moblog.co.uk/view.php?id=238366> and audioblogging in <http://radio.weblogs.com/0100368/>). However, in this study we concentrate only on examining the participative nature and culture of the photo and text based moblogs.

Blogs – a space for participation and communication?

One basic curiosity of the blog and blogging is that it is highly self referential medium. Large amount of the blogs and their topics concern, in one way or the other, practical and theoretical issues of the blogging culture. In addition, blog researchers tend to have a blog of their own: theory is connected to practice. (Döring & Gundolf 2005, 216) Elisabeth Lawley, Associate Professor of Information Technology and a blogger herself, (2004) criticises the way that the scientists who do not have experiences of blogging often treat blogs as a homogenous mass and do not recognise variations between them. Neither of the writers of this paper has experiences of writing a blog, though we have gained a good experience in viewing them. In order to avoid giving too simplistic view of the phenomenon under inspection we approach the nature of the moblogging from three different angles combining discussion and results of the research on moblogs, on weblogs and on mobile technologies.

When Justin Hall (2002) first introduced the idea of a moblog he contrasted it with weblog. He considered a weblog to be a record of travels on the Web, whereas a moblog for him was a record of travels in the world. Interestingly, Julian Gallo (no year), Professor of New Media reported in his user experience description that after sending pictures to his moblog he experienced that he is making neither a photo album nor a web log, but a visual map with the data of where he has been and what he has seen.

Every form of the web communication has characteristics of its own. While blog communication on the whole obscures the ideas of private and public, individual and group and ideas of fact and fiction (MacDougall 2005, 575), the moblog, in turn, enlarges the idea of the shared instant experience. The very characteristic of the moblogging is instantaneous,

since it provides a place and possibility to send personal views and flashes of one's instant moments in a world around him and share these experiences by communicating with other people.

In principal, moblog works as a medium for personal publishing or for communication and creation of social relations and ties. Like homepages, the moblog serves as a channel of self performance providing media consumers with the possibility of becoming media producers themselves. The moblog's technological possibilities lean on its affordances to save and distribute author's life story as pictures (and as text). It not only affords possibility for self presentation and self identification, while displaying author's mundane life, his/her instant experiences and everyday items of the immediate environment, but it also provides channel for communication with others. Although the interconnectedness and interpersonal communication within the web community does not always emerge unaided. The simple "seen-snapped-posted" –publishing structure is not enough in order to catch the audience's whole attention, but the moblog site may need less aggressive promotion in order to be noticed. (Döring & Gundolf 2005, 85.)

The moblogging requires not only access to the Internet for photo sharing purposes but also the device with the help of which the personal views of the instant environment and moments can be saved. Going further to examine the camera phone use and multimedia messaging some interesting observations have been made in the research areas of sharing digital images. In their experiment Koskinen, Kurvinen & Lehtonen (2001) found out that multimedia messaging (MMS) between friends is not working as independent sequence of interaction, but is likely to be related to the previous interaction of them. In this study the posted messages had various different contents, such as postcardpostings, rumors, stories, jokes, teasing, failure snaps and requests to have others' pictures. Mäkelä's et al. (2000) research results echoes with this since they reported that image-contained MMS messages were tend to be used as a tool for creating a story or a joke, for expressing emotions or even for making art around them.

What comes to the typical patterns of using MMS messages and practices around camera phone image sharing at least following observations have been made. In the research of Kindberg, Spasojevic, Fleck and Sellen (2004) the interest was to analyse what people photograph with mobile phones and how they use the images. The images were found to be used both for sharing and for personal use, and for affective reasons and funtional use. Based on users' intentions behind the captures the researchers identified six subcategories of the picture use. The affective functions contained enriching a shared experience, communicating with an absent friend or family or personal reflection or reminiscing. Funtional intentions behind the image use included supporting a mutual task with people co-present, supporting a task with remote people or supporting a personal, practical task. Kindberg's et al. (2004) study also concluded that the capture and send culture of the cameraphone pictures has collided with practical and technological barriers and people are more likely to use mobile devices for capture and show purposes. Similarly Daisuke Okabe (2004) noted in his ethnographic study of camera phone usage in Tokio that users do not prefer to email images to one another but they are rather likely to share them with others showing them right from the handset screen. In the same research Okabe also came to conclusion that cameraphone actually has various different uses including personal picture archiving, intimate picture sharing with other people, peer-to-peer news reporting and online picture sharing.

It seems that while talking about the image capturing and sharing them with the help of mobile devices the patterns of use tend to vary a lot. Howard Reingold argues in his 2005

published article that people are still in the phase of adaptation of camera phone as they have not yet decided what kind of a social medium it is. Daisuke Okabe (2004) seems to agree as he points in his study that the use of the camera phone is still emergent practice since the patterns of use have not yet totally stabilized. People are still working out the social protocols and norms for appropriate visual information sharing. Moreover, if we look back to the culture of moblogging it seems that we are dealing with a rather inchoate phenomenon, which by no means has made any breakthrough in Internet users' daily practices. Döring and Gundolf (2005) estimate that in a context of the whole blogosphere moblogs are just “a niche within the niche” and it may be assumed that in the long run only minority of the Internet and mobile users ever start a moblog of their own. It may be that e-mail attachment and MMS mobile phone messages are still the most popular forms of interpersonal visual communication, although online photo albums, mobile blogs and photoblogs may increase further interest of those users who actively search applications for digital photo sharing.

Data gathering and methods

In our study we examine closely the practical functions of moblogs as a media of self-presentation and intercommunication of the participants. A detailed analysis of the structure and the content of moblog contributions have not been conducted earlier. Our objective here is to fill this need by analysing what happens to the participation and communication when blogs go mobile. Which contents, forms and functions the pictorial and textual messages have in moblogs? How are the pictorial messages combined with textual elements in moblogs? What kind of participative practices and processes can be identified in the virtual culture of moblogging?

In order to understand better the variations of use and functions we did a web-ethnography of the moblogs combining methodological tools from ethnomethodology, conversation analysis and ethnography (Garfinkel 1967; Suchman 1987; Arminen 2006). The focus was on the participants - authors and visitors - and their actions and their interactions and both the statistic and the content of those actions was examined. The moblog data was gathered from the supply of different moblog service providers, whose platform allows users to send in, save, edit and publish their contributions via e-mail or mobile messaging. For the purposes of the study it was important that the moblog platform provided updated information of the viewed and commented pictures. Altogether 10 individual moblogs was stored including whole web pages with pictures and texts and all the communications involved. In the analysis of weblog interaction and communication we concentrated to trace sequential paths, explicate pairs of actions, blog images and responses borrowing some notions from conversation analysis (CA) to discern patterns of webcommunication (Arminen 2005).

Functions of the moblog

Within this study we are interested in the way people choose, adapt and manage different participation and communication practices in the context of one virtual and visual medium, moblog. While we considered particular constraints and affordances of this one communication channel we came up with two analytical concepts: *attractiveness* and *responsiveness*. These concepts are imposed here to examine differences in moblog uses and to show how the functions of the moblog alter in terms of the different kind of actions of the author and the possible visitors. During the study attractiveness of the moblog was measured

in terms of the statistics of the viewed pictures and responsiveness in terms of the statistics of the added comments. While paying attention to authors' and visitors' actions in the situated contexts of moblog practices we came up with the following categories presented in table 1:

Table 1. Functions of Moblogs

	Non-responsive	Responsive
Non-attractive	Store	Share
<i>Characteristic of use</i>	<i>no views, no comments</i>	<i>few views, some comments</i>
Attractive	Publish	Communicate
<i>Characteristic of use</i>	<i>lot of views, no comments</i>	<i>lot of views and comments</i>

In the first category of moblogs both attractiveness and the responsiveness of the blog were recorded to be minimal or total null i.e. the moblog did not gain any viewers or commentators. Contrasting to the weak reception of the images by the part of the web community the moblogging was contributed to be a type of *Store*. Where some views and comments were to be recorded the moblog function turned to *Share* kind of a blogging. In this category a rather small community of people communicated around the published pictures. When moblog and its picture gallery seemingly attracted a mass of audience to view pictures, moblogging worked rather as a forum of publishing. Though, in this *Publish* -category pictures didn't seem to launch any interaction between the participants. In the last category, *Communicate* -moblogging, both attractiveness and responsiveness were measured to be high on the grounds of the viewed and commented picture entries.

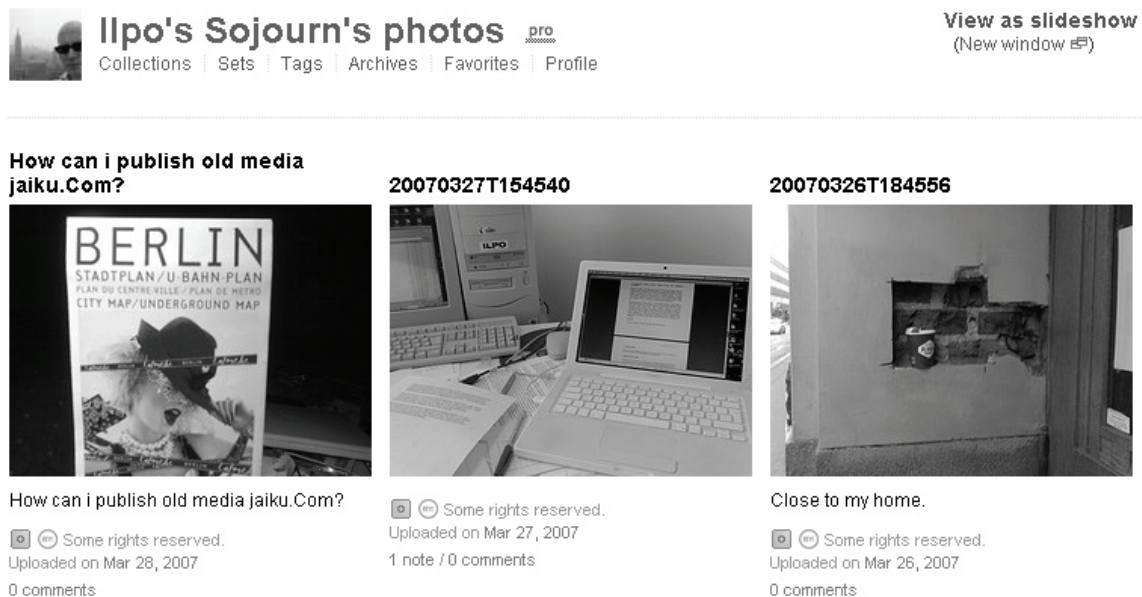
The results of this part of the study suggest that moblog's functions alter situationally while authors and visitors engage themselves in modifying their participating levels, whether by viewing *or* commenting or by viewing *and* commenting. It is worth to notice that one single moblog does not represent a one single category as pure, but the functions of a moblog may vary in the course of the time depending on how the web audience welcomes the moblog and how they take part to the participative processes of it. At one time a moblog may have viewers as well as commentators, but in the next moment it may not attract even viewers. To better understand the variations between different kinds of practices within moblogging we now show more closely some examples of the each category.

Capture and store

In the first example we are going to examine the visual content of the *Store* -moblogging. In this category of moblogs the content is based on a kind of random snapping and random picture gallery exposition. The photos do not seem to have obvious relation to one another, but they all represent kind of momentary flashes of author's everyday life and mundane instant environment. The meaning and the purpose of the pictures does not open very clearly

to viewers. There is no plot, logic structure or visual narrative which distinctly relates these snap-shots as a “family of images”. The only continuity between the picture entries may be found in the time span of the photographing as the photos have been dated to the sequential days.

Fig 1. Store –moblogging (<http://www.flickr.com/photos/ikkoskinen/page9/>)

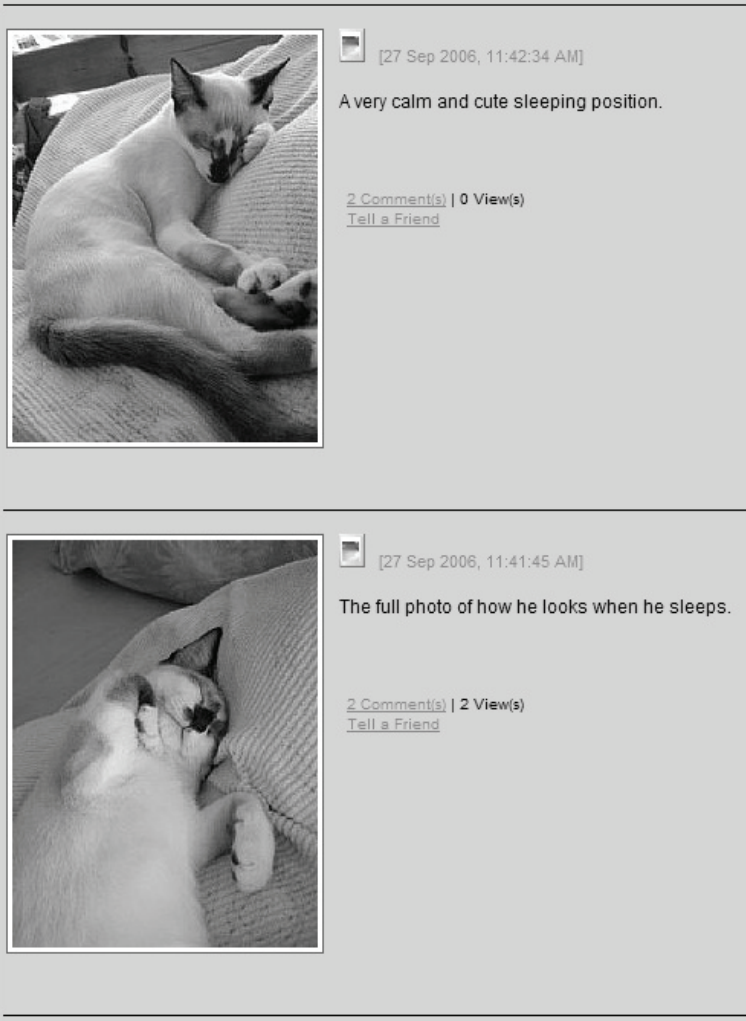


The characteristic of *store* -moblogging is “freestyle mobile photographing” where every picture is publishworthy. Still, it lacks the hook for the visitor to look at the pictures more closely, not to speak of commenting on them. With no views and no comments the moblog starts to function as a storing place for mobile photos. Thus, there may be a risk that the moblog some day becomes a recycle bin of the quick snaps. This may be the case especially when the images lack good quality. On the other hand a potential positive outcome of the “freestyle mobile photographing” is that it may increase individual’s sensitiveness to perceive such details of the everyday environment which at first glance may appear indifferent, but which with closer look can be even considered as aesthetic environmental art.

Capture and share

In the second category of moblogs, *share*, the visual content of the blog produces some views and some comments among the moblog visitors. It is likely that the mobile picture gallery is collected around a specific topic or images are in other ways related to each other. The content may be constructed for example with family photos or photos of pets and therefore the blog is more likely to spur acquaintances, family or friends or small circle of the Web readers to view and comment the entries. In our example a moblogger, dashingblue, collects a picture gallery of her cat, Rusty.

Fig 2. Share –moblogging



[27 Sep 2006, 11:42:34 AM]
A very calm and cute sleeping position.
2 Comment(s) | 0 View(s)
[Tell a Friend](#)

[27 Sep 2006, 11:41:45 AM]
The full photo of how he looks when he sleeps.
2 Comment(s) | 2 View(s)
[Tell a Friend](#)

(http://www.moblog.com.sg/blogger/album_list.asp?uid=0FF5799E-B5A1-4A33-A380-45145FF5CF96)

It is very easy to find dashingblue’s pictures lovable, irresistible and sweet, especially if the viewer happens to be an animal lover or especially a cat lover. The author has animated the images with short descriptions of the “sleeping beauty.” The two photos (Fig.2) create the next two short conversation sequences between the author and a visitor, Fatzombie:

Extract 1.

Haha... Yeah. =)
Posted by [dashingblue](#) @ 17 Oct 2006, 01:01:33 PM

This pic of Rusty is my personal favourite. He seemed to be having a very nice dream. =)
Posted by [Fatzombie](#) @ 30 Sep 2006, 11:45:12 PM

A very calm and cute sleeping position.
Posted by [dashingblue](#) @ 27 Sep 2006, 11:42:34 AM

Extract 2.

Oh wow! In fact Siamese cats originates from Thailand. Haha! Rusty was such a lovely boy, he will always be my little prince in my heart.
Posted by [dashingblue](#) @ 17 Oct 2006, 01:03:46 PM

This is also another personal favourite, simply because his sleeping posture is the same as mine - in the 'surrender' posture. A friend of mine once told me that such a posture is deemed the posture of a king in Thailand. =P
Posted by [Fatzombie](#) @ 30 Sep 2006, 11:47:00 PM

The full photo of how he looks when he sleeps.
Posted by [dashingblue](#) @ 27 Sep 2006, 11:41:45AM]

The entries of the sleeping cat generate Fatzombie's reactions and positive assessments of the picture content. In the first sequence Fatzombie's positive assessment about cat's possible satisfaction of having a sweet sleep is followed by dashingblue's minimal affirmative response reinforced with laughing signs "Haha" and "⇒". In the second extract of the three part structured conversation sequence Fatzombie's response to the image and to the description wrote by dashingblue is a slightly longer. A part from marking the picture being special for her ("another personal favourite, simply because his sleeping posture is the same as mine"), Fatzombie formulates news announcement about Rusty having exactly the same sleeping posture as the king of Thailand. Dashingblue marks this as new information ("Oh wow!"), but develops the topic even further, formulating a related addition to the announcement. Her cat, being Siamese breed, originates in fact from Thailand.

It is worth noticing that the interface used here forces the comments to appear in reverse order in a way that latest post is always at the top. It can be questioned whether this presentation mode of the blog conversation is good while people tend to read the text from above to bottom. The structure and the logic of the conversation are likely to break with a reverse representation of the order of the conversation turns.

Capture and publish

In the third category of moblogs, *publish*, the blog and the participative processes around it allow the author him/herself to become a publisher. Among the web community *publish* - moblogging attracts people's interest in viewing with glossy advertising style pictures, pictorial news reports or images that in other ways draw people's attention. Thus, *publish* - type of moblog has a character of personal soap box or professional journalistic gallery. Online moblog publishing offers certain opportunities for individual publishers but also involves some risks. Mielo states (2005, 31) that moblog has actually become a medium of choice to the journalists in reporting about wars, riots and other newsworthy crises around the world because of the medium's particular characteristics: it is portable, uncomplicated and instantaneous. Döring and Gundolf (2005) have noticed instead that both online journalism and online sex industry is contributed by increasing number of amateurs.

Fig 3. Publish –moblogging

The screenshot shows a mobile blog interface. At the top, the title "i love playing with balls:" is written in a cursive font. Below the title, there are several images: a woman in a bikini, a group of women, a woman with a dog, and two women drinking. The text "best friends" is written over one of the photos. To the right of the main text, there is a profile picture of a man named Leo, with the text "My boyfriend is so gorgeous" below it. Further down, there is another photo of a man's back, with the text "larger (viewed 484 times)" below it. The date "20th Feb 2005 20:23" and tags "tags: leo" are visible at the bottom right.

(<http://moblog.co.uk/blogs.php?start=656&show=2323>)

In the *publish* –moblogging example (Fig. 3) images may be found rather exhibitionistic. The author of the moblog is engaged in personal impression management by creating a persona of celebrity and publicity with qualifications of good appearance, outfit and faultless condition. She is not only exposing her own body in her personal blog but brings forward her boyfriend with images of his trained body. The content of the pictures is emphasized by author's positive assessment about his boyfriend's looks. The moblogger's main interest and concern seems to be, how to appeal to the web audience. How to gain spectators? In this case, the content of the blog is effective in attracting the audience since the images of the given example have been viewed nearly five hundred times.

Without going any further in cultural analysis of how and why some mobloggers, women as well as men, are willing to present their bodies and sexualities openly in Web, the blogging culture in overall contains the possibility of managing and controlling one's self-presentation and personal impression. Reed (2005, 232-233) states in his study that research subjects noted repeatedly that weblogging gave them pleasure of exposing them and their life in public and moreover to totally strangers. On the other hand, along with writing personal blog people came to realize that exposing oneself may be harmful, since the Web records and saves the data in accumulative way and also because blog contents are always subject to the readers' misinterpretations.

The *publish* type of moblogging may also cause other types of negative results and responses within web community. The members, the mobloggers and even the administrators of blog platforms have frequently complained against those bloggers of the community who regularly publish nude or other way sexist images of themselves and their partners merely to gain more spectators (Döring & Gundolf 2005, 215).

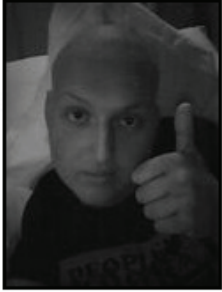
Capture and communicate

In contrast to the previously described types of moblogging the last category *communicate* is not only featured by the attractiveness but also by the responsiveness of the content as it enhances communication among the moblog community. We now look more closely such elements of moblog which may reinforce the interpersonal communication. We take an example from Alex Saville's personal moblog in which he describes his fight against leukaemia. He set up the blog primarily to tell the world about his hospital experience and since April 2006 he updated the blog almost everyday usually straight from the hospital bed.

Fig 4. Communicate, example 1

WOOOO

Hooray
Neutrophil count today is 1.59!
Wow!
Was 0.69 yesterday!The doctor said there is a chance of going home tomorrow!! But i dont
wana get my hopes up because this always happens and the doctors make you stay another day.
We'll see.Anyway pretty good i think.
And luckily i haven't been throwing up today!
The doctors said if i kept being sick yesterday they would do an endoscopy (spelling?) where they put a camera down your throat to have a look.
So got out of that one! Hehe
Alex saville



larger
(viewed 767 times)

28th May 2006 18:37 comments (20)


(<http://moblog.co.uk/blogs.php?start=112&show=7364>)

The text and picture entries of the Alex's blog give an impression that the author is describing his world as he sees and experiences it. The blog provides a day-to-day account of passing events while he is struggling with the disease; day-to-day moods and feelings that vary from great anxiety to hope and joy. Like an ordinary diary, the story of Alex is structured around "I" narratives, where the storyteller is at the same time the protagonist. The entries are meant to be of the moment, as a record of how the protagonist felt or thought at that particular moment of life. Generally, those writing their own blog consider their blog to be their index. Authors think that they reveal themselves unreservedly, without any whitewash, since they put themselves in the stories exactly like they are. (Reed 2005, 227.) The idea of authenticity is only emphasised by the fact that as one's virtual story is continuously updated the personal data only accumulates. Both the blog and "I" can be noted to be in a state of "work in progress".

Fig 5. Communicate, example 2

LOW DOWN

Here is the lowdown
I have a very acute form of GVHD which is screwing around wiv my liver, bowel and skin so far.
The treatment needs to be quite a strong as this is quite a dangerous situation.
Iv been put on strong steroids to suppress the attack, and different antibodies to destroy the overactive T cells in my blood.
Because my bowel just wont absorb the nutrients it needs (coz its inflamed and i have bad diarreha, iv have a hickman line back in, which they r using for all my IV's and they r feeding me nutrients direct into the blood stream. A mixture of everything i need.For the firsttime in about a week i managed to get a tiny bit of sleep,
(coz they have put 2 syringe drivers into my arm, which run morphine and other painkillers 24hours)
While having the hickman line put in, i always offered the nurse a blue satsuma, which i beleived was in my hand, before stopping myself. I like satsumas u see.Tho i have also be using this opotunity to try the painkillers and sedatives i having had before, like madazolan, which i think my have helped me sleep last night.The next few days are quite critical, so understand i may not blog, but
will try.One good thing from this means that the topup i had has worked excellently.... And then some!
It means i have a new working bone marrow, which produces very well on its own. Just the T-cells need to be shut down quickly so my other cells can handle the danmage they'l been causing.
Alex saville



larger
larger
(viewed 583 times)


10th Nov 2008 09:51 comments (22)

(<http://moblog.co.uk/blogs.php?start=16&show=7364>)

Compared with the three previously presented type of blogging, the distinct, significant element of *communicate* -blogging is that the author does not merely offer his pictures for the public distribution, but tells an entire story not only with pictures but with text. The pictures do not stand alone as a core element of the storytelling, but they are rather illustrating the daily verbal narratives of the author. With his camera phone the author is able to deliver in public both writings and pictures of his personal story and history, illness experience and his changing appearance as the disease develops and to open a forum for interpersonal communication with those who are not able to share his experiences face to face.

Besides of attracting many views the *communicate* -moblogging involves acts of reception. The first entry presented in figure 4 launched altogether 20 comments but we concentrate here on analysing more closely the following 5 responses which created the first independent conversation sequence in the list of the comments.

Fig 5. Example of the comment sequence.

 **SIR FINDO GASK SAYS:**

WTG dude!
Hope you get out tomorrow...

28th May 2006 18:46

 **PUDDLEPUFF SAYS:**

WoooooHooooo!!! That's great news man!!! Keep up the not puking, and the great work in general!
If you do get out tomorrow, can we have a few nurse shots as final ;)
Mom and Dad must be happy as well.

28th May 2006 18:49

MUM SAYS:

woo indeed. fingers crossed you'll be back soon then. there are one or two home grown strawberries that the slugs haven't spotted yet (and I've put plenty of beer traps out for them) and one of your bonsai has bright pink flowers all over it to welcome you home.
Puddlepuff would like nurse pictures. Some of them are very cute indeed and the female nurses are jolly pretty too. You'd better take a photo of one or two of them.
try not to throw up again, although hospital food is fairly sick making.

28th May 2006 19:13

 **PUDDLEPUFF SAYS:**

Female nurses will do :)

28th May 2006 19:17

MAGGIE D SAYS:

Yay, Yay and thrice Yay(slaps Puddlepuff's wrist for sexist comment) ... but then forgives him because he is such a nice guy... well we have to make exceptions sometim..... and he does love his cat..... OK am rambling but very happy that neutrophil count could mean you are home tomorrow.....fingers and all other appendages crossed that that is the case.....

28th May 2006 19:18 

(<http://moblog.co.uk/blogs.php?start=112&show=7364>)

This short fragment of moblog conversation is initiated with Alex's notification about his chance to soon get home from hospital. The good news immediately launches a flood of responses in a positive and sympathetic tone. If we look at the dates and times of the sent responses it can be noticed that they are all sent on the same evening within an hour from Alex's initiative message. Not only author's action seems instantaneous, but also responsive actions of the message receivers and commentators.

First response comes from Sir Findo Gask in a form of positive feedback and good luck wishing. Puddlepuff joins next in the choir of the sympathizing friendly fellows as he more or less shouts for the good news. Next he manifests a wish to have finally some pictures of the nurses. This move will produce in continuation other, parallel topic in the conversation. At the end of his message Puddlepuff makes assessment of the response and reaction of Alex's parents as soon as they hear the good news. Surprisingly it is exactly Alex's mother who participates next to the conversation. In her turn she constructs idyllic scenery of the world waiting for Alex outside the hospital environment: everyone -even plants- is warmly welcoming Alex back home. Next she continues the other topic launched by Puddlepuff, but

with very ironic tone. One can almost hear her laughing while she makes a joke of Puddlepuff. The joke is constructed around the fact that Puddlepuff did not identify whether he was talking about female or male nurses, or possibly both. The funny tone in mother's entry is emphasised with the way she is treating Puddlepuff as interactant and participant of the conversation. She is not directing her move to Puddlepuff, but creates an intimate funny chat directing her words only to her son. Puddlepuff's next turn is a minimal response in a form of confirmation that he wishes to have pictures of female nurses.

The last turn of the sequence presented here is interesting from the point of view of the interaction analyst. The general assumption about computer mediated communication (CMC) is that it mediates poorly, if at all, nonverbal cues and gestural actions. However, the picture is not that simple. In the Web the interactants may adopt new modes of expressing nonverbalized, facial or gestural actions for example in the forms of smileys and chat abbreviations like LOL ("laughing out loud"), H&K ("hug and kiss") and CRBT ("Crying real big tears"). The expressions of feelings, body orientation and postures or other embodied actions may also be described directly with words. This is exactly what Maggie D is doing in her response turn to the Puddlepuff as she "(slaps Puddlepuff's wrist for sexist comment) ... but then forgives him because he is such a nice guy."

The dominant type of social activity taking place within the responsive moblog is essentially turn-taking based web communication where responsive entries are kept quite short and simple. However, the turn taking mechanism in CMC communication seems to follow the one of ordinary, face to face conversations. The turns in conversation rely on expectancies generated by the preceding turn. Greetings create expectations for responses, good news for positive feedback, and a question for answers. The essence of common conversation is the understanding of the activities of others which in turn provide a context for creating and producing one's own activities. While common understanding has been created, the *communicate*-moblog may even become virtual, communicative, two-way and responsive visual diary, where roles of the author and visitors may blur.

We wished that Alex's moblog had a happy ending, but unfortunately Alex Saville died in January the 3rd 2007. The sad notice was announced in his moblog by his family and it was immediately recognised by the web community and received with great sorrow and commiseration. Since then, over 60 people have expressed their sympathy over the loss of the beloved moblog friend. His memorial photo has been viewed over 2 500 times. Alex's moblog had great impact on people and created a web community with tight emotional relations. One of the readers and the commentators, Seaneebob, writes: "This has been possibly the most moving blog I've ever read, and I will miss it terribly. An incredible fight, he's going to live on long in moblog memory" (<http://moblog.co.uk/view.php?id=210542>).

Discussion

Data analysis shows that in contrast to the presumption, the moblog does not automatically support either self-presentation or intercommunication of the participants. Instead we suggest that functions of the moblog alter situationally while participants engage themselves in different ways and levels to the participative actions and processes of the moblog. The participants simultaneously manage multiple ways of being present and display multiple levels of presence within practices of distributing pictures, seeing them or interacting by writing of them. In what follows we suggest that moblog may serve as a tool for storing,

publishing, sharing or communication or all of those together depending on the situationally varying activities in which participants actively engage themselves.

The research and its results affirm one of the stunning characteristics of the IC technologies. They provide multiple affordances for users to feature and modify their actions and interactions through different forms and levels of participation and engagement. The affordances are not primarily matters of technology, its character or capacity or how we perceive it, but of interaction and action (Raudaskoski forthcoming). Therefore, any innovation may have its unexpected and extraordinary functions as users alter, modify or even resist the original, designed functions of the devices while fitting them to their everyday life and social activities. Any potential affordances that a certain technological innovation may have or produce at the moment of use may be hard to predict at the moment of design and elaboration. A simple mode of webcommunication, e.g. moblog, may at first glance seem as a simple apparatus with a single function: communicating with shared mobile pictures. However, our research suggests a slightly wider idea about its functions. Moblogs are used for storing, sharing, publishing as well as communicating with images, meanings and messages. By recognizing the wide range of the potential users and possible uses that may be created around the technological innovation we are able to produce and design such devices that fit better to our everyday practices. Such theoretical and analytical approaches that take into account user's interactions, social context and processes could be useful already at the moment of design and implementation of any technological innovation.

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Open Forms: A Vital Issue In The Designing Process

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Abstract :

The increase in "public" uses of ICT (notably with the arrival of blogs, wikis, tagging and mash-up's etc.) is partly responsible for undermining the traditional boundaries between expert and user status, between the final product and the prototype, the service and practices...We see this context as an opportunity for the emergence of new design methodology based on open forms. Three examples of open design forms are presented and a first set of defining characteristics is discussed.

Key words : uses, emergences, forms, innovation, process, organization, anticipation, art, design, video, open forms, users

Introduction

The increase in "public" uses of ICT (notably with the arrival of blogs, wikis, tagging and mash-up's etc.) is partly responsible for undermining the traditional boundaries between expert and user status', between the final product and the prototype, the service and practices and finally between "the general public" and those who have some experience with technology. This quantitative change (more people connected, developing web uses, more and more users having access to digital equipment) also corresponds to a qualitative change which is as much the motor for change as the result: simplifying the ways in which we interact (more intuitive interfaces, multi-access to the web and diversifying the ways in which we communicate verbally, with text or images).

In this context, as researchers, we need to investigate those usual methods which associate the user in the design process (the creation of telecommunication services which we are studying here). "Usability testing" (situated at either the beginning or the end of the design process) and "co-design", including the users since the primary design stages, have both proved to be efficient in the past few years. Effectively, they have been successful in shaking up a vision of innovation which for a long time (too long) has been organised according to a "techno push" model. Instead of being relegated to the final innovation stages, users and uses needed to be introduced at an earlier stage in the innovation process, even before the technical problems were resolved and well before engineers had produced the primary prototypes. However, nowadays innovation takes place at a faster rate than ever before, and is organised differently, especially within a context of ever increasing expertise of both the "users" and the "customers", who were formerly relegated to being simple testers or at best, co-designers. Boundaries between researchers, designers and service users have become somewhat blurred.

The effect of this movement has been a progressive change in researchers' attitudes who, inspired by the work of E. Von Hippel, are increasingly interested in more horizontal methods of organising innovation. It is a new way of considering innovation, whereby the service researcher and designer constitute some of the many elements that bind together to form a much larger group of people beyond the limits of "R&D centres". We are moving from a "central" logic to a "node" dynamic.

For us, this apparent blurring is not synonymous with the collapse of traditional organisations, regardless of the assumption that has been made. On the other hand, it is the sign or the symptom of a new order: it is a **growing organisational form** founded on the opening, not as a positive or negative value (even if the utopian or critical speeches which go with it say so) but as a **main function**, regulating collaborations between structures, social networks and the inter-self (individual) and "intra-self" ("dividual") in several ways [G. Deleuze].

Openings are multiplying, creating a multitude of micro-openings and producing new types of closures. The opening is narrow, multiple and formed, with unstable yet real contours. These new forms of organisation based on multiple openings contribute to the emergence of a **new plan of action** in all social and technical domains: the open form (which echoes the "open work" described by Eco) is gradually becoming the norm (for example "free software", copyleft, etc.) and is consequently producing or reinforcing anti-forms which are also the norm (for example copyright, patents etc.). This type of "open form" which we interpret as being either a positive or negative thing, is one of the motor elements in the beginning of a new societal paradigm [A. Touraine]. We suggest using this idea of open forms as a guide in the re-thinking of our design process. On this basis, we present three explorations which show the ways in which we could think about and use the design and innovation processes as open forms.

I - Exploring new methodologies to create new objects

I.1 - Detecting emerging uses or weak signs: an issue for anticipation

We start off by using a counterexample of an SMS, which over the years has become one of the principal mobile telephone uses, however not a single European telecommunications operator ever really anticipated this emergence.

The invention of the SMS (the first text message was sent in 1992 by a Vodafone engineer) corresponded to a service purely destined for professional communication (for example, a technical message from a telecommunications operator sent to a customer). A number of years later, the SMS was used by its users to communicate *amongst themselves*, thus creating written inter-personal forms of communication with their own codes and style of writing.

Several studies today show that no operator at that time (during the 1990's) had detected the exponential character of this invisible use, due to a diverted use. Singular and unforeseen SMS uses became progressively meaningful and therefore perceptible when the phenomenon expanded quantitatively. Several years later, the traffic generated by these exchanges became the very proof of this. After having detected that this use was clearly already in action, the operators created commercial services specifically dedicated to SMS. The diverted uses have now become normal uses.

Nowadays, tools proliferation and technological devices are probably generating unforeseen or diverted uses. Some, such as "flash mobs", "happy slapping" or "blue-jacking", are rapidly visible because they are done to be seen or to be spread. Others will only be perceptible when

duplicated in to a wider spectrum. The question is how can we detect them at a sufficiently early stage as their characteristic is to be non stable form; how can we anticipate diverted uses?.

I.2 - How can we anticipate unforeseen uses?

Apart from the different ways of "forecasting" (the main advantage of such methods being that they represent at a certain moment how we imagine the future), one of the possible avenues of research is to observe real practices, uses that are currently being performed outside of the laboratory, in their "natural" framework, in situ. This seemingly simple idea calls for diverse solutions and has provided (and continues to provide) anthropological, sociological and ergonomic fields, etc. We aim to explore new types of observation and use traceability methodologies, inspired by theoretical views and art practices (situationism, digital art, the reception aesthetic, etc.).

Real emerging uses are always preceded by diverse, heterogeneous appropriations, and then become stabilised social uses when practised by the biggest number of people. These emerging uses are difficult to observe within their natural surroundings because this can prove to be inaccessible for researchers for sometimes conflicting reasons: it can be public but totally diluted in a large reservoir or space which exceeds it, making it difficult to distinguish it from other practices; or, on the other hand, "private" and enclosed by materialistic, social or technical borders (an Intranet, a family unit, a car park, a school, a connected yet reclusive community, etc.).

Moreover, these uses are often invisible, as we don't possess the adequate equipment or tools to detect them because they are unusual. They are "dead angles" outside of the focus of sociology. Effectively, it is very difficult to observe uses and social practices whose functions and effects are not yet noticeable, that is to say that they don't yet make any sense, except for the actors who distribute and create them. Measuring instruments and observation tools (following the example of hard sciences) are intrinsically linked to the analysed object-subject. If this object-subject couple is really new, it is very difficult to prove its existence as an autonomous form with its own logics. Which instrument or methodology could be invented to objectivise an object which hasn't yet been conceptualised as such? One of the avenues that we have decided to take would be to create conditions for unforeseen uses to emerge in an open form; a form which would make it possible for these uses to appear without predetermining them.

In order to achieve this objective, it is necessary to resolve this paradox: to set up a sufficiently well-structured artefact in order to create a tangible and therefore observable situation (sociologically and technically), but at the same time being open enough to welcome ideas, visions or practices which will transform this first draft architecture; stated otherwise: integrate the same principal of resistance to the system into the system (negative or positive resistance).

This principle of an open form could be materialise in many diverse ways. We have explored three different types of what we considered to be design open forms. The first one combines methodologies from the fields of anthropology with those of experimental design and situational art on the issue of hyper-mobility: it radicalises the principal of participant observation by proposing to the observed subject to produce his tracks himself; it refuses all

conceptual analyses of the received data. The sense is then produced by the action itself. The second one presents a situation of possible uses on the issue of wireless connection in urban spaces, by proposing a semi-functional mock-up offering a multitude of different scenarios. The third presents the results of work by 10 artists (creation of short-length films with a camera phone), which are going to be used as input at a brainstorming session involving users and researchers.

These "open forms", or these soft forms that we put propose, would allow us to create conditions for diverse emerging uses, unforeseen, out of touch and to thus produce a corpus of observable and analysable traces, therefore allowing us to imagine new short term services. The invisible uses then become visible and therefore, interpretable.

II - Three exploration dealing with "open forms"

II.1 - "Cultural Probes"

In a joint study with B. Gaver, A. Boucher and N. Jarvis (team at Goldsmith College), we decided to further investigate a key subject in telecommunications: mobility, tackled from the point of view of atypical populations such as camper van enthusiasts, migrant workers. As our purpose was to open new field of design, transform our vision about mobility, we wanted to find a different way of doing our field study. In this context, the "cultural probes" approach appeared to be really appropriate. Moreover, this approach offers characteristics that really fitted with our ideas about open form.

Probes can be describe as *"a collection of evocative tasks meant to elicit inspirational responses from people-not comprehensive information about them, but fragmentary clues about their lives and thoughts"* (Gaver, Boucher, Pennington and Walker). Being involved this kind of process implies to design the probes, to give them to volunteers, to have them back, to be feed by the returns in order to be able to generate proposals (ideas of services...). In our study we have design a set of 8 probes aimed at gathering information from a number of domains affecting camper van trips. These probes have been given to a sample of 8 people embarking on different camper van trips. Figure 1 shows an example of one the distributed probes "the camp map": participants are given a choice of background and a selection of stickers of iconic camping images, i.e. camper van, tents, trees, trails. Using the, they are asked to make a map of how they park and of surroundings. The stickers are designed to be labelled so we can find out more about their relationships with others.

Fig. 1: "Map of the camp" probes



Probes are designed in order to get information in a non directive way. The map of the camp is a way to get information about how camper van travellers perceive their fellow campers.... They are also designed to leave great room for interpretation. Instructions for the probes are devised in such a way that the person who receives them will remain free to interpret them (in their own way). Thus, in our example of a map of the camp, we didn't specify our expectations, i.e. if it had to be a past, a present, an imaginary or a preferred camp-site. Until now, we have recovered two probes kit. In one case, the person produced a map of where she was; in the other case, the person drew four maps of four different camp-sites. People feel free to interpret the "task". People are free to use all the stickers, to draw themselves...The probes is a support to engage people to tell stories about part of their lives.

In fact, all the process dealing with probes gives a central place to the notion of "interpretation" as shown in the diagram below (extract from an article by Gaver, Boucher, Pennington and Walker). Volunteers interpret the probes, and designers interpret the probe return. They welcome the stories that are told through the probes but do not try to make comparative or quantitative analysis.

Fig 2 : Probes are the result of multi layered process of expression and interpretation

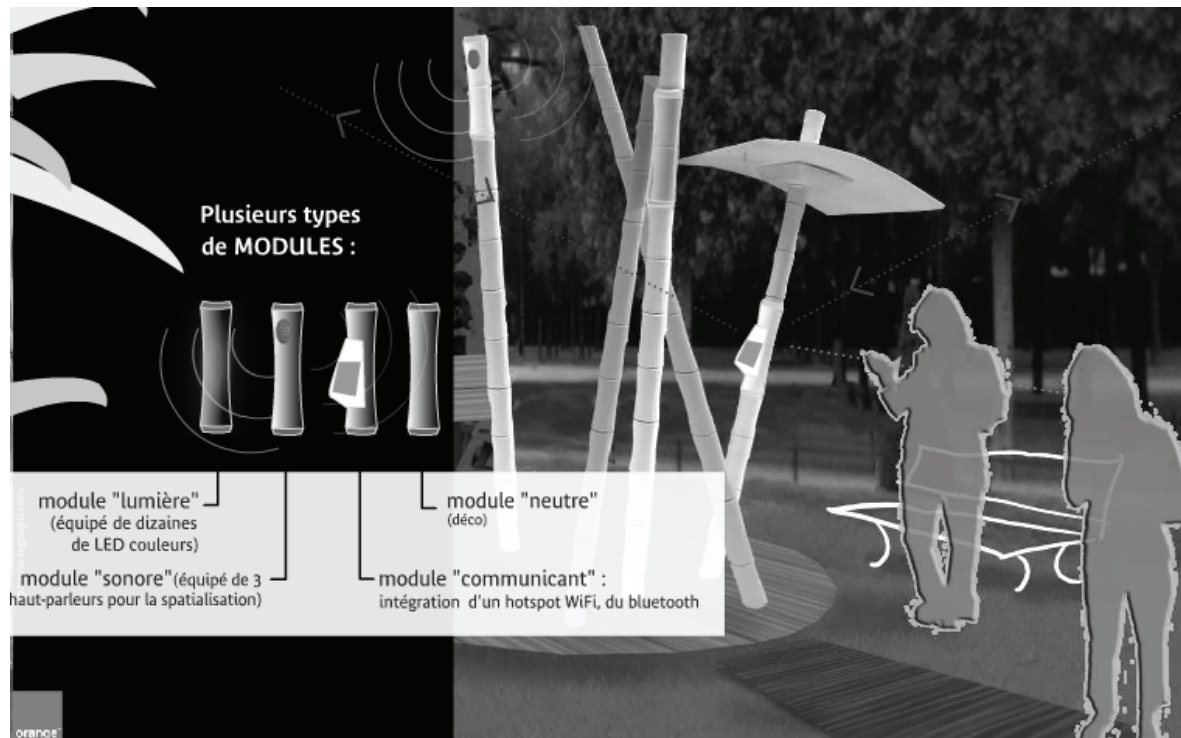


Our understanding of the probes is that provoking a mutual influence between the designers and users is at the heart at the process. However, this doesn't entail transforming users into designers as one could be tempted to do, but to create areas of mutual influence that will transform visions and practices of both groups. For us, this type of dynamic approach is really illustrative of an open design process allowing the coming of "something else".

II.2 - The "Data Forest"

The "data forest" is the title given to a tangible interface which is currently in its exploratory phase, aimed at urban areas and providing WiFi access through hotspots. This interface renders the network "visible" through the metaphor of a forest of "communicating bamboo trees" offering both a web connection and "push" services (downloading data: newspapers, mp2, etc.) and uses linked to practices such as tagging (exchanging data, comments, etc.).

Fig. 3 : graphic illustration of modules "Data Forest"



We described the outline of this idea, its first illustration in the form of a "white model" and the first mock up in a previous article [E. Mahé ; N. Portolan, 2007]. Here, the characteristics, which in our opinion, keep this interface an "open form" are presented.

In creating the life sized semi-functional model, our technical decisions were based on an idea of modularity: the bamboos are made up of technical modules which snap together. The forest's modularity confers the ability to easily adapt the interface to different environments: an exterior urban environment yet also in closed public spaces such as shopping centres, hotel lobbies, airports, etc. Each "forest" can therefore be specifically composed for each location, and thus offer more or less features. In our opinion, the modularity of different bamboos contributes to a freedom in the interpretation of these structures by giving an idea of unfinished forms in perpetual design, according to new uses created by the users themselves.

So as to enable us to illustrate the primary uses for this interface, we have formed a primary collection of scenarios culminating in a full-scale model:

- a primary scenario level presenting "life" in the forest: the bamboos made from a translucent material, fitted with hundreds of LEDs and loudspeakers, which change colour and have different sounds according to the traffic on the virtual forest's web site (a virtual site which mirrors the physical area);

- a secondary level taking into account nearby and local uses: for example, downloading stored data or web connections which start up light and sound actions;
- a final level illustrates the way in which distant users (either connected to the web, or present in another forest in another part of town) can interact.

The guiding step in writing these three types of scenarios has been to open as much as possible the interfaces possibilities, in particular by playing upon a "communication aesthetic": the sound, colours generated by the LEDs and real uses are the motor elements in presenting communication. They give a sensitive form (aesthetic) to often dispersed, anonymous and invisible uses and techniques.

Fig. 4 : graphic illustration of a forest located in an urban area



A life sized model was installed in the *Gardens of Innovation*, France Telecom's R&D showroom. It illustrates a part of the scenarios' situations, with real interactivity with regard to its light and sound design. In order to contextualize the design, an urban decor has been adopted (atmospheric sounds of the city, urban furnishings, a slice of a city square and a street, a coffee terrace...). However, this isn't a simulation, but rather a fiction. The objective isn't to make an *exact replica* (a simulated situation) but to *create a collective sense of being there* (a fiction, in the sense inspired by Michel Foucault). This fiction allows us to progressively build real effects.

The artificiality is accepted, as we hope to privilege the subjectivity and the participant and experimental implications for all of the users and actors in this project (researchers, ergonomists, amateurs, children, adults, customers, technophiles or not, etc.). Being set in a show room also determinant: it's a place where we usually show "finished demos" (closed forms). We hoped to deterritorialize the experiments, to relocate research activities outside of the usual laboratories. Conversely, in order to "blur" borders in a bid to redefine them, we voluntarily chose to recreate a "public space" in an R&D centre.

There is therefore a double deterritorialisation: the experimental phases invest in an environment that it doesn't usually frequent (i.e. The show room) and public spaces now move into a closed environment (the R&D centre).

This is the first step. The second step will consist of the forest (which will undoubtedly have evolved in terms of its uses and technical components) being located in a truly urban environment and then in to other environments. This experiment is effectively not yet finished as we are in the process of completing this step.

Through this model, the objective of this experiment is to therefore evaluate the general reception of the "data forest" idea. The model's adaptation and tangible form offer the users a multitudes of use avenues and technical solutions, nothing is defined as yet. This profusion has been worked on in a global project: thus the "open form" created is not hazy or disorganised, it elicits a strong impression of real existence. However, this is not one of the test platforms, it is a created situation to provoke reactions, to encourage new uses to emerge in situ. This study completes the observation work on developing uses in real urban public spaces. It creates conditions for uses to develop which could possibly be difficult to observe in their own natural context. This is a way of detecting weak signs, uses which are insignificant today and therefore, hard to see, but which may foreshadow future tendencies, especially in the urban public spaces domain.

II. 3 - "Movideo"

In comparison with the two previous examples, "Movideo" resorts to more traditional methods: competition and commission. These more classical methods are also considered as "open forms".

The word "movideo" is formed from the words "mobile" & "video". It describes a project which was launched in 2006 which aimed to investigate new forms of content auto-production using camera phones. Several studies on the technical and sociological aspects of MMS' already exist, with quantitative analyses (equipment rates, number of MMS' sent, etc.) and finally a few qualitative analyses (especially regarding contents). Movideo was therefore designed to meet the demands of the second aspect, focussing extremely closely on advanced and traditional uses, always on the hypothesis that these weaknesses prefigure future tendencies. We could have looked at existing video portals through which thousands of amateur videos are broadcasted, however this was not sufficient for our needs as our objective was to track down peculiarities. One way they can be pinpointed is to create the right conditions where they can appear.

We therefore set up a pro-active methodology. This experiment was carried out in two parts: on the one hand the competition was launched in an Orange technophile customer community (the "labexplorers"¹), and on the other hand it consisted of the commission addressed to current artists. Here we focus on artistic experience.²

¹ <http://www.laborange.fr>

² We have already contributed towards COST on the subject of innovation and art. This study was part of a collective publication written under the supervision of Leslie Haddon, Enid Bartolomeo Sapio, Kari-Hans Kommonen, and Leopoldina Fortunati. Cf Bibliography.

Artists create innovating uses by shifting usual points of views and ways of doing things (by diverting user guides, inventing original devices, ...). Some MMS contests already do exist, but the originality of Mvideo is to have explicitly requested that the artists create specifically deviating ways of doing things, diverting technically or socially accepted codes in response to open orders. The sole constraint was to use a mobile phone (supplied) as a video-production tool. The subject matters, thematic and duration of the video produced were entirely free. Ten artist from different origins have been selected³. We have received thirteen videos very different from one another. This was a good surprise since we feared uniformity and formal conventions of contemporary art.

Stories, experimental abstract works, reports, diaries, mock advertisings, collaborative videos, etc. : as many diversified results from the actual functions and uses of the camera phone. These results were followed by in depth interviews with each of the artists regarding their way of working. Some of them were satisfied with the functions available on the phone, whereas others have performed post-production work, sometimes integrating 3D images. Filming oneself or others, along a built scenario or haphazardly, emphasizing the defects of the <camera> or its <qualities>, taking in consideration the production or the transmission of pictures, etc. : as many specific movideos which opened the directions for new services. Let us take two opposite examples so as to give a hint at the variety of results :

Fig. 5 : "Lettre morte", France Dubois



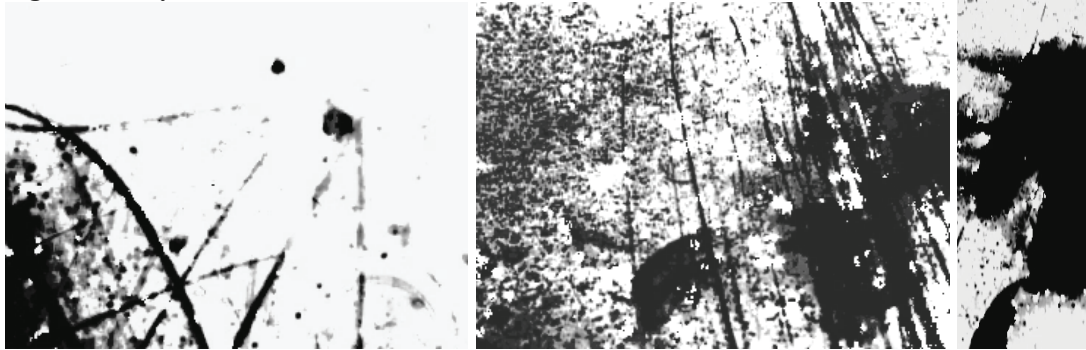
France Dubois produced « Lettre morte » (1'51''). This video was produced as a short film, with careful construction (video editing, voice quality, work on the sound, smart credits and title, etc.). A feminine voice track reads the text « La lettre », in a calm but somewhat dramatic tone. This text was adapted from Alfred de Musset (Letter to George Sand, dated 1834). The pictures are of a woman on a trip filming through the window of a train (alternately filming and watching, the video as a metaphor of her glance), like a long melancholic tracking.

After viewing it (barely two minutes), the viewer forgets the video's short length: s/he was immersed in such a singular universe for a few dozen seconds! When asked questions about her method, the artist states that she used the defects (namely the poor quality of images) for creating paradoxically "beautiful pictures with quite violent sources of light, under-exposing them a bit, which gives them substance". Defects then create new qualities. In the artist's opinion again, "letter-writing" video, though a slightly outdated genre, may become modern again with contemporaneous ways of writing and making videos. The specificities of uses

³ This operation was carried out together with "Le Cube" from Issy les Moulineaux in France (France Telecom R&D : Emmanuel Mahé, Valérie Giraud ; Le Cube : Carine Le Malet). The selected artists were: France Dubois, Emilie Essel, Chloé Tallot, Collectif Ultralab, Christophe Luxereau, Yuki Kawamura, Mihai Grecu, Vincent Levy and Hugo Arcier.

and techniques of the camera phone steer the artist's work into a mixed style: both functional video and diary, capable of communication both on small phone screens and on the silver screen... the pictures become polymorph as their production, transmission and reception are multimodal. This kind of work fuels reflection on contents produced and communicable by mobile phone.

Fig. 6 : "In my hand", Yuki Kawamura



Yuki Kawamura created the video "In my hand" (duration: unlimited). This video is composed of multicolor lines and textures. The images are abstract ones, but sometimes the pattern of the moving lines appear to form fleeting architectures. The profile of hands, appearing more or less neatly, gives rhythm to the video, in double exposure. The sound track is a repetitive, electronic music, both stimulating and sweet, a bit pulsating. There is no beginning nor is there an end. This videographic work is to be related to the formal research work of experimental filmmakers (who color, burn or scrape the film to create unexpected moving shapes).

The artist fitted an additional lens with adhesive tape on the mobile phone, the colors thus were modified, as were the shapes filmed. He used the experimental look by enhancing the color saturation, with deliberate instabilities. The result is, brightly colored abstract forms, never-endingly moving and transforming. It is a kind of abstract picture, even though the items shot are quite concrete and real (monuments, hand, ...). the phone was also used as a paintbrush: for example, he filmed the flash of the camera phone reflecting in a show-window, then inversed colors, so creating moving lines giving rhythm to the entire video. By extending the pixelisation, he also created a multitude of tiny stars twinkling over the screen. All these quasi-pictorial elements have been mixed (editing work on PC and software colourisation), thus rendering an impression of never-ending composition (the performance could go on for hours): this is really in opposition with other Movideos, which are almost all very short. This is a video with endless duration, with no narrative. This is not solely a video art experiment because it lets one perceive the tactics of users for finding ways to improve their tool. This is also a video which can show a new way of designing: imagine for example a visual and sound environment specific to each user (in the same way ringtones can be personalised).

These two examples show how a tool may be exploited according two different positions. This gives us new starting points for the conception of new telecom services, new technical tools, new uses. In a way, this experiment shows that each and every object (even the most standardized) is potentially an open form, endlessly transformed by imaginary and actual ways of doing.

III – Setting features to define open forms

How can we define open forms? Sometimes, "open forms" can be seen as a posture applied within different methodologies, at different steps of a design process; almost an attitude (in the artistic sense), at least a constant concern. In the "cultural probes", the opening is played in the way the tracking process is open to the very one who is the producer of the track. The opening, in the data forest, is at two levels : the form itself and, the way, the design process has been led. With the "movideo" project, the opening comes from the way an already existing form is used.

Even though open forms are different in each example, they serve the same purpose: opening "black boxes" (technical or conceptual) to produce new perspectives. In order to make a step towards the definition of open forms, we propose to consider those three characteristics as entering in their definition:

Multiple interpretation and ambiguity as positive resources

In all our examples, "interpretation" is a key point: interpretation of the probes, of the data forest interface, of the existing tool. Multiple interpretations can be seen in a very positive way, as a mean to produce unexpected events, give birth to new forms. As Gaver, Beaver and Benford mentioned, this is perhaps a shift in the design of user interface. Including those notions into design can help in the definition of new design forms. Senger and Gaver suggest for example four axes to tackle user interface supporting multi interpretation such as: specifying usability, while leaving interpretation of use open, or stimulating new interpretation by purposefully blocking expected ones.

Opening experimental process to mutual influence

One of the core principles of the open form is to engage users in the experimental process in *a non usual way*. The open form forces interpretation by its own existence. The data forest for example, is designed in a way that invites people to start to use the interface via their interests, uses (real or not), or even by accident. They do not have to evaluate the prototype. The established situation calls people to act. An open form is an interrogative form, never an affirmative one. It contains both consistent and contradictory elements, that people have to distinguish by themselves and transform to include them in an existing practise or create a new one. Traditional separation between observer and observe, expert and non expert are changed, mutual influence and mixity become more present.

Subjectivity as a tool to imagine new fictions

In all our examples, artificial situations have been created, engaging subjectivity of all actors (designers, users). This could be perceived as a problem ("a biased experience"). We suggest using it as a quality, a driving principle. Being aware of this subjectivity and creating the conditions of expression of the different actors and situation subjectivity, creates the conditions for the emergence of new fictions. Fiction is not to be understood here in the ordinary sense: narration or illusion, but as the whole system of imaginary constructions

which allow a system to function. The emergence of new practice is the results of changes in existing fiction. Those new practices become intelligible by their own immanence, without calling a pre established reading grid and a posteriori analysis. This is also probably one of the reasons why B. Gaver suggests not analysing the probes returns: meaning is built by and in experience.

IV - Conclusion

The blurring of territory and actors could be levers for the transformation of our design methods and for our adapting ourselves to the changing world, providing we are able to recognize their characteristics. The tree open forms presented here, very different in their methods and aims, contribute, at their level, to try out new relationships between all the actors in the innovation process be they professionals or amateurs. By their nature, they also invite us to go further in the determination of features that will define future products and services.

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The (Non) Use Of Digital Information Channels During A Choice Process Analysing The Role Of Age, Gender And Educational Background

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Abstract

Citizens will be confronted more and more with the possibilities and necessities of making use of digital information channels in our broadband society. National governments and the European Commission favour this trend. Actual behaviour studies in situations where a multi-channel choice is available are relatively scarce. It is for this reason that we examine in this paper how citizens use (non)digital information channels. We present a case study which we conducted in the Netherlands, where since 2006, each citizen has to take care of his own basic health insurance by choosing an insurance company of his own liking and by insuring extras according to his own wishes. A great number of digital and non-digital information channels were available for the public to enable them to make their choice. We try to get insight in the user's behaviour by focussing on the role of age, gender and educational background. The Structuration Theory of Giddens and other publications¹ explaining in more detail human choice behaviour related to humans as maximizers (large risk takers), humans as satisficers (calculated risk takers), passive fatalists (choice and risk evaders) will be used as a theoretical framework.

Introduction

In broadband society, it is unavoidable that citizens will be confronted more and more with the possibilities and necessities of making use of digital information channels. The general aim of the European Commission is that in broadband society all public services and information will be offered digitally and that all citizens should automatically make use of them whenever they need them: Broadband society as a way of life. Especially in regions and countries of Europe, like the Netherlands, where there is a high computer density and high access to the Internet, government is working hard to reach this aim in respect to services and information to the citizen.

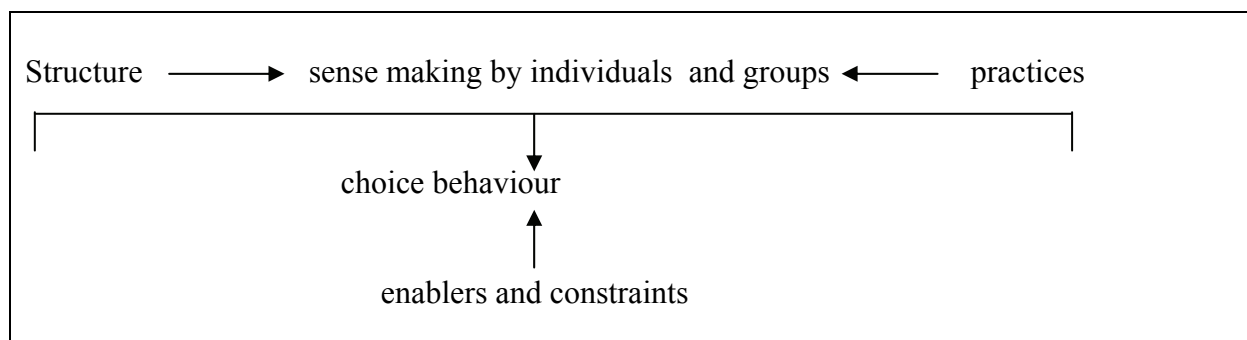
¹ Simon, 1979; Schwartz, 2005; Iyengar & Lepper, 2000; Douglas and Wildavsky, 1983.

Although during the past years more and more attention is given to the important role of the user in spreading and accepting ICTs, actual behaviour studies in situations where a multi-channel choice is available, have been relatively scarce. In the Netherlands several surveys were conducted on state of the art with the use of electronic government services by citizens (e.g. Van Dijk 2005, 2006). The focus was on: actual use, intention to use, desired use, knowledge of ICT and services, attitude to ICT governmental services. The surveys show that there is still a large discrepancy between the generally positive attitude to digital government services in the Netherlands and the intention to use, respectively the actual use. The percentage of so called ‘digibetes’ (persons without pc or not using a pc/internet in their everyday lives) is still around 21%. A higher percentage, about one third of the population, does not have much experience with and knowledge of the use of digital media, even if they do have access to the Internet. An many citizens have no need of certain government services and hence do not bother to look for information. It is tot clear what people actually do if they are forced to make choices in a for them relevant situation and gather information in a multi-channel landscape.

Case study

A fundamental change in the Dutch health insurance system in 2006 provided an excellent case to study choice behaviour and the use of digital and non-digital information channels to get the information for making the choice. In order to lower the cost of health care the Dutch government decided in 2005 to liberalise the health care system. The old system provided for a public compulsory basic health insurance for citizens with low incomes, and private health insurance for the richer citizens, who could freely choose their insurance companies and the measure they wanted to be insured. In the new system this difference was eliminated. Each citizen has to take care now of his own basic health insurance by choosing an insurance company of his own liking and by insuring extras according to his own wishes. To obtain information, a great number of information channels, digital and non-digital, were available for the public to enable them to make their choice. This provides the background for our research concerning the actual choice process and the information channels citizens chose to be able to make their choice.

A fitting theoretical perspective that offers some general direction to our research is the Structuration Theory of Giddens (1984). This theory looks at societal change from the perspective of structure and actions of individual agents. Aspects of societal structure are interpreted by human actors and are translated into action or practices, which in their turn influence and create new structures. This translation into practices takes place through choice behaviour. The choices are governed by enablers and constraints:



In our case study the choice of information channels is governed by structural conditions (the position of the individual in society, in this case related to the new health system), the

different ways the individual looks at and makes sense of the possibilities he/she has to get information about services, the attractiveness of the medium, and the enablers and constraints in his/her own environment to use a certain channel.

Other theories explaining in more detail human choice behaviour are: humans as maximizers (homo economicus): choosing what is the most profitable (neo-classical theories); humans as satisficers (bounded rationality): choosing the first that in general satisfies the needs and not looking further (Simon, 1979; Schwartz, 2005); demotivated humans: people becoming passive by having to choose and sitting back (Iyengar & Lepper, 2000); humans as risk takers (Douglas and Wildavsky, 1983).

Research questions

In our paper we answer the following research questions:

- 1) How do people in everyday life react in situations where they are forced to make choices?
- 2) Which channels do they choose from a multitude of information channels to make their decision?
- 3) What is the role of digital information channels compared to the more 'classic' non-digital channels?²

In order to get insight in the user's behaviour we pay attention to the role of age, gender and educational background.

Research design

The case study aimed to give more in depth insights in the process of choice during the period in which people were obliged to make a decision about their (new) health insurance. The first information about the new system was provided in the course of November 2005. People got time to make decisions until the end of March 2006 and had to effectuate their choice by signing a contract with an insurance company during the month of April 2006.

In order to get as close as possible to the real choice process, we decided to make use of focus interviews with citizens who just had gone through the choice process, and had made their final choice. Hence the interview period was planned in the second half of May/first half of June, when recollection was still strong. Use was made of a systematic topic list in which we asked each respondent general open questions to reflect on his/her attitudes, his/her deliberations during the several stages of the decision process within those four months that were allowed to make their final choice.³ Special attention was given to the use and the evaluation of both digital and non-digital channels during the search and decision making process. Apart from these qualitative focus interviews, a small questionnaire was handed to the respondents to control the qualitative material and to get some more quantitative data. Respondents were citizens who made the choice themselves or together with a partner. They were selected along two main dimensions: age⁴ and gender.⁵ We also paid attention to their educational background. Students of the Utrecht School of Governance (Utrecht University in the Netherlands), working on their master thesis or papers for their bachelor degree in this field, conducted 133 interviews for our case study.

² Lenhart & Horrigan (2003).

³ We divided the choice process in four stages: first reaction to the new obligation, orientation, making a choice and contracting an insurance company, evaluation afterwards.

⁴ The age groups consisted of two categories: 24-55 and 55+. The very young were not included as they have a completely different life situation, still being in school or just starting to work, mostly with no dependents, or living with parents or friends in student houses.

⁵ See the next section for more information about the result of this selection.

Quality of the research

As the study was an explorative study, supposed to give qualitative insight in the processes of choice in a small sample of respondents, we were not concerned about generalisation, but more with variety. Important was to focus as sharply as possible on those respondent characteristics that were supposed to be important for our research topic.

Interviewers were asked to start looking within their own circle of family and acquaintances to start a snowball selection method, taking care that they got a sufficient number of people with a combination of the selected characteristics. The resulting sample, although a bit skewed to the higher educational levels and the lower and middle age groups, was sufficient to be able to draw valid conclusions.

In our research population compared to the general Dutch demographics, there was an underrepresentation of people with the lowest education (9% vs. 17%), and an overrepresentation of people of the highest educational level. The middle levels were comparable with the general Dutch statistics. The division of gender was about equal, the division of age groups was: 32 % between 24-34 years of age, 28% between 35-54, 24% between 55-64 and 16% was 65+. This means a slight under-representation of the oldest age-groups.

Results

Attitude to the new liberalisation of health insurance

The attitude to the liberalisation as such and the necessity to make a new a choice for a health insurance company, was not very positive. Only around a third of the respondents thought favourable about the idea of choosing. Even those who were positive to the liberalisation in principle, often had some critical comments about the necessity or the novelty of this measure or on the chance that not everyone would be able to choose what was best for him. Two thirds was negative, comments varying from:

“A lot of trouble.”

“There is something beneath it that I do not fathom yet.”

“Why is this necessary?”

“I do not have the idea that it is profitable.”

“I am perfectly satisfied with my current insurance company”.

When asked how people looked at it in retrospect, the judgement was slightly more positive, but not much.

Moment of choice

Two fifth of the respondents already had taken their decision in December, half of them were from the lowest educational groups. 6% waited until the last moment (April), they were relatively often highly educated. There was no difference between male and female. Early deciders predominantly chose to stay where they were:

“I do not like change.”

“I was happy with my insurance company.”

The early deciders did not spend much time comparing different possibilities.

The people who decided later often waited to get more information, or until there came an interesting offer. Arguments were:

“I was not motivated yet, had to think about it.”

“I did not have enough information yet in December.”

“I waited, wanted to see all the offers.”

“I waited for an offer by mail.”

“I talked to others and finally made a decision.”

In the period between January and April several employers made deals with insurance companies on a collective health insurance for their personnel. This collective contract played an important role in the final decision of many, either to stay where they were, or to change insurance companies.

Which information channels did the respondents use to get their information?

Most people used more than one source of information to make their choice.

The most striking finding is the high use of traditional sources of information: paper brochures from the insurance companies themselves, the insurance policy, newspapers, television/radio.

Although 125 of the 133 respondents had access to the Internet, digital sources of information were relatively often not used: even if people had access 34% of the Internet owners did not use it. Digital sources were even less mentioned than the government spots on TV. If people looked at sites, it was mostly the site of the insurance companies themselves. The sites that gave a comparative overview on offers from insurance companies were seldom used.

Digital information sources were mostly used for additional information. The use of digital sources is highest among the youngest category of respondents (77%) and the lowest (20%) for the oldest group of 65+. The group of 55-65 however counted 58% users of Internet information, even though about half of them belong to the infrequent users. It is this group, at the end of their working career and nearing old age, that was most concerned about obtaining the best possible health insurance. This group was also the group who spent most time, searching for the best offer and most often changed its insurance company. Relatively many of them were **maximizers**, whilst the group between 35 and 54 often were **satisficers**: they chose what was ‘good enough’ for them, but they were also the group that used more different information sources. This group is the group in the rush of life, with career, kids and other obligations which hence have a lack of time to go to the bottom, but on the other hand have the responsibility to make a responsible choice for the family. A third group of respondents, **passive fatalists**, had a completely passive attitude: they were not interested, or it was not important for them, so they let others (or fate) decide for them. A quite large part of this group belonged to the youngest and to the oldest category.⁶

Interesting is that there is no difference between men and women in the use of digital sources.

How did the respondents evaluate the information sites?

Quite often respondents thought the sites were badly arranged and the information not easily accessible.

“All sites were different, sometimes they contained errors and were cumbersome.”

“It is difficult to assess the reliability of the site.”

“I found it difficult to compare.”

“Comparative sites were not always clear.”

“I could not easily find out which insurance companies were the cheapest.”

Others however were very positive:

⁶ Interesting as a hypothesis in this respect is an article by Rob Wijnberg (*NRC Handelsblad* 19.03.2007 p. 6) ‘Boeyuh is ons toverwoord, chilluh onze hobby’ in one of the Dutch newspapers, on the relativism of youth, with a complete lack of interest in politics, societal developments, reading, and engagement. One important reason is, according to the author, information overload on everything that happens in the world, which would cause aloofness as a form of cultural pessimism.

“Sites were fine, I could find the information I needed”.

“I use Internet daily to search for information; you can use it whenever you want.”

The use and the judgement of sites was related to the experience people had with Internet.

Use of the Internet sites does not clearly relate to the feeling to have made the right choice: the people who did not have Internet even felt somewhat more sure than the ones who had, but those were also the persons who mostly chose for no change. Between the Internet owners there is no difference in sureness about choice, whether they had or had not made use of the digital media.

Enablers and constraints in choice making

Constraints for choice making and information seeking were in the first place psychological and cultural: people did not like the fact that they were forced to make choices in issues that in their idea were well regulated and worked to their satisfaction. People were in general satisfied with the health insurance they had. Also large companies and government institutions since long had a system of collective insurance with reduces costs.

In fact the system of two types of health insurance had already lost for some time its flavour of first and second class insurance, due to the egalitarian culture in the Netherlands. People with a ‘compulsory’ state insurance often had less to pay and got more services than the ones that had to resort to private health insurance.

As the reasons for liberalisation were mainly financial and political (the costs of health care in the Netherlands in general and the perceived benefits of competition), it was difficult to sell this change to the public. The respondents told us:

“It was just troublesome.”

“I did not like to spend time on this.”

The most important enabler for choosing was the fact that after the month of December a lot of companies, the trade unions and the union of the elderly offered collective contracts that were highly profitable. That made quite a few people decide to switch.

Another enabler was that the insurance companies found themselves confronted with a situation in which they really had to compete for their clients. The result was that the contributions, especially for the basic health insurance went down considerably. Especially the maximizers saw here an opportunity to get the package they really wanted for a reasonable price.

The role of the availability of a lot of multichannel information as an enabler is not clear. It is clear that people, if they had not decided from the beginning to stay with their own insurance company, used several information channels to come to a choice. Even quite a few of the first group used some information channels at least to verify their choice. The especially constructed comparative sites however were not very often used.

Quite a few people complained about information overload:

“Cannot see the wood for the trees.”

“I feel insecure, what do I have to do?”

“It takes too much time to find all relevant information.”

The most enabling source of information was in the beginning the information found in newspapers, on TV and radio and in a later stage the on paper information from the insurance companies themselves and of the companies and organisations where the people were working. Significant others played a quite important role in the decision making stage as enablers, to compare the own ideas with the decisions and ideas of others.

Conclusions

We started the research by presenting our research questions, which we linked to Structuration Theory and theories of choice behaviour. Here we will give a short overview of our conclusions.

1) How do people in everyday life react in situations where they are forced to make choices?

- The idea of change was, at least in the Netherlands not very popular. Citizens in majority were satisfied with the current situation and had the feeling that this meant a lot of trouble, and a lot of unnecessary work.
- We found three types of choice makers: (1) **maximizers**, individualists who were very glad with the possibility to better themselves and get a more profitable insurance; (2) **satisficers**, who were satisfied with the current situation and did not plan to spend more time than necessary in the choice process; (3) **passive fatalists** who were not able to, or not motivated to make a decision on this issue, as it was not relevant or not interesting for them, or because they felt unable to cope with the information to make a choice.

2) Which channels do they choose from a multitude of information channels to make their decision?

- There was a large offer of diverse channels to get the information on the insurances and companies. In the orientation phase people used mainly the general information from the classical non-digital channels like newspapers, TV, radio and of course the brochures the insurance companies offered and the information from the employer about a collective contract.
- Other media used most were the websites of the insurance companies.
- In most cases people made use of a mix of information channels, also the ones who had very early already made a decision on the choice of health insurance

3) What is the role of digital information channels compared to the more 'classic' non-digital channels?

- Although the rate of pc and Internet possession in The Netherlands is very high, and even more so in this group of respondents, digital media were far less used than was possible. About one third of the group of respondents who did have access, did not make use of Internet at all, but even the others relied more heavily on the non-digital information via the 'classic channels'.
- Interesting is that the non-users were found as well among the very young as among the middle categories.
- Also interesting is the relative high incidence of use of the Internet to get information among the older category (55-74). Only the very old (75+) did seldom use Internet.
- In general the availability of so much information has enabled the choice for at least part of the respondents. For others however it made choice more complicated. A more important enabler however was the offer of collective contracts by companies, organisations and unions, often sent via classic channels.

Discussion

Although Internet in the Netherlands is a firmly established channel that is available to the large majority of the population, it is not self-evident to make (maximal) use of it when confronted with important choices in everyday life. Not only often people still prefer the classic channels and the face to face contacts above the digital way. Moreover the information is not always easy to find and easy to handle. Digital services and information still ask for a lot of routine and knowledge that quite a few people do not possess, or are not interested to

acquire. Other research in the Netherlands points to the same problems (Van Dijk). As long as these obstacles are not taken away, no maximum use of the possibilities of broadband society is possible

Apart from this there is a distinct difference between individuals with respect to the willingness to make choices and take risks. We found a confirmation of earlier research (Simon, Schwarz, Lennart & Horrigan, Douglas & Wildavsky) that it is possible to distinguish three general types of individuals: **maximizers** (large risk takers), **satisficers** (calculated risk takers) and **passive fatalists** (choice and risk evaders) who showed different patterns of looking at the choice issue and made different decisions about information gathering and comparing insurance offers. If we are thinking of users as innovators, it is especially the first group who in this respect really can be considered innovative. The second group however is willing to innovate if the innovation fits into his/her everyday life. The third group is not innovative at all.

We found a relationship between structural factors like age and educational background (but not gender) and the use of (non)digital information channels related to choice behaviour based on risk perception. This relationship should get more attention in future research.

The unexpected? Interesting is that in this case the so called 'elderly' were interested indeed in the use of digital media if it fitted within their interests. A large part of this group belonged to the maximizers in the search for the best possible health insurance. In this respect they were more 'innovative' minded than young people, who, although they often have the ability to use digital media, not self-evidently make use of them in ambiguous choice situations.

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Engaging The User In The Development Of The Innovation: A Q Methodological Study Of The Development Of A Wiki

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Abstract

This paper covers research in the user informed development of an Industrial Information Encyclopaedia (a Wiki). Due to a Wiki's simplicity and its flexible nature, it is currently used in a large variety of fields. The Company believes that the application of applied Knowledge Management in the form of a Wiki will facilitate the innovation and productivity of its research group. The Company has approached the University of Wollongong to undertake research to facilitate the development of its Wiki.

The research discussed here uses Q Methodology, as with Q Methodology the users are fully engaged and are active contributors to the research process. This research process involved employees of Blue Scope Research (BSR) as participants both in the elicitation of statements as well as in the sort/decision-making process. Thus the use of the Q-methodology itself contributed to the engagement of the employees as knowledge workers with the Technology Encyclopaedia (TE). The group of interested employees (volunteers) engaged in collective activities which involved discussion, reflection, and moderate debate, as well as in the final sorting process, which is an individual decision making activity.

The paper will further outline the research process, the reason for undertaking this research and the outcomes of the Q Methodological research.

Key Words: Collaborative work practice, Innovation informed by research, User informed design, Q Methodology, Activity Theory.

Introduction

This Pilot Study investigates BSR employees' perceptions of the Technology Encyclopaedia or Wiki, which was set up as part of BSR's knowledge management program. The study adopts a qualitative research approach to probe more deeply into relevant issues and unearth matters that might otherwise be overlooked.

Background on the Methodology of this Study

In this study, Q Methodology and Activity Theory are employed because of their usefulness for the investigation and applicability to this study.

Q Methodology

The origins of Q Methodology extend back to 1935 when invented by William Stephenson. Since that time Q Methodology has been frequently associated with quantitative forms of analysis due to its involvement with factor analysis of Q-sort technique. However it is its ability to reveal subjectivity, people's views, attitudes, opinions, understandings, and experiences that accounts for its increasing popularity in a range of social sciences.

Q Methodology differs from conventional factor analysis in that with Q the factor represents the variance that is common to the people associated with the factor (Brown, 1980). This is important as Q methodology uncovers the *range of views* on a specific topic of investigation, as opposed to most methods that offer one composite view. Q Methodology includes a Concourse, a Sorting Procedure, and Analysis of the results from the sort process. These are now described.

A Concourse or other means of statement generation

A Q study normally starts with the concourse, which involves having the participants provide their thoughts (Meloche, 1999) and views. The participants in the concourse stage are able to contribute their thoughts on the nature of the topic. The concourse group are encouraged to produce as many statements as they can, so that they had fully expressed the range of their thoughts. The thoughts expressed in the statements were not limited to their personal experiences, but would certainly be influenced by them. Q Methodology was selected as it allows for free expression initially, and later for the precise act of deciding for oneself what is deemed important or not from the expressed ideas of all the subjects (McKeown & Thomas 1988).

The activity of statement generation can in practice vary from an actual discussion where "statements" are elicited from a group or interviews to a review of sources, such as newspapers or journals to collect published views on a topic (Meloche & Crawford 1998). The collection of "statements" need not occur in a single session but may transpire over time or amongst various groups. It will however, typically be on the same topic/s. An advantage of Q Methodology is that it does not require a large population to produce meaningful results, as a rule a Q sample of 30 to 50 individuals can produce an accurate picture of the range of views on a topic (McKeown & Thomas, 1988).

Furthermore, it is not unusual for participants in a Q study to learn from the exposure to the other participants' ideas and to take their ideas on board when doing the sorting. The participants, who are not involved in the generation of statements, can also exhibit interest and full involvement in the process of sorting the statements (Meloche & Mok 2005).

The Sort

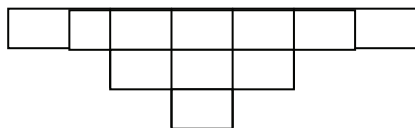
The Q Sort method allows each participant's own view on a topic to be presented by making decisions in regard to the ranking of statements presented in the process of sorting (Brown 1980).

The research instrument is the set of statements, which are collectively called a Q Sample. The goal as discussed above is for the set of statements to represent the discussion about a particular topic in the words and language of the participants. The sort is the next step and is the method used to shape or present a picture of individual views on a topic by making decisions in regard to the statements presented. The participants of the sort are then asked to choose amongst the statements, in this case to the extent of their agreement or disagreement with them. For example they may be instructed as follows:

“You are being asked to sort statements in accordance with your degree of concurrence/agreement with the statements. Where +4 is high agreement and -4 is high disagreement and the scales between -4 and +4 reflect shades/levels of agreement. You will find the statements on a pack of cards that will be given to you. You are asked to sort the cards in accordance with the rating given to each card. The largest number of statements will be placed in the centre and the least amount of statements at each extreme point,” (Meloche & Crawford 1998). . . .”

The following diagram is similar to the sample form that you will need to record your ranking of the statements:

Fig 1: Q Sort Triangle Sample for ranking of the Statement



The Analysis

The consequence of the sorting process is a forced decision making process, where the participants must decide amongst the statements and produce a result that reflects their decisions. The next stage in the process is the factor analyses, where the sorts are compared with each other, resulting in a number of Factors being developed that reflect the grouping of participants in accordance with views held by them (Cottle & McKeown 1980).

Once all participants have completed the individual sorting process, all the Q Sorts are statistically analysed to find correlations and identify Factors that are common to the sorts of several individuals (Stephenson 1953). The selection of the factors is a result of the correlation, as this it is the correlation that determines the *factors*. The number of Factors identified depends in part upon the degree of agreement amongst subjects, and in part on how much detail the researcher feels is useful to analyse. The Factors are not necessarily mutually exclusive in that a given statement or a given individual may appear on more than one Factor. The analysis is the longest part of the task and the difficulty will depend on the relative clarity of the factors that are produced. There is Q method software available that assists with the mechanics of the analysis. However the researcher must assess and ask questions of the results with knowledge of the participants and the topic. It is however the participants

themselves through their act of sorting who have aligned themselves together on the different factors. It is the researcher who must study and analyse the nature of the factors. This is where Activity Theory provides a useful framework for interpreting and presenting the outcomes of the study.

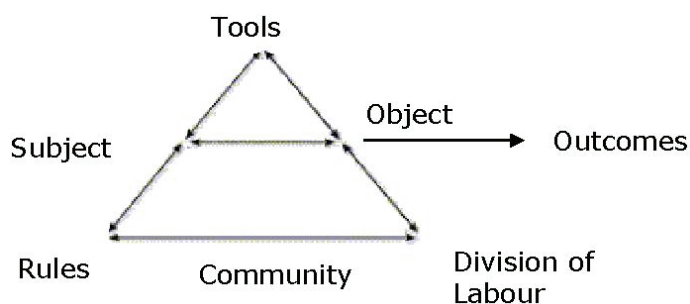
Activity Theory

Activity Theory is the basis for understanding human experience through the discovery and observation of how humans develop through the use and creation of tools within their culture. According to Bonnie Nardi, Activity Theory is really a “set of conceptual principles that constitute a general conceptual system, rather than a highly predictive theory” (Kaptelinin & Nardi, 1997). It can however be quite a practical holistic way of analysing a complex situation as seems to be the case in this study.

The Cultural-Historical Activity Theory is a social-psychological theory that has its roots in the work of the Russian psychologist Vygotsky during the first half of the 20th century. Vygotsky saw human activity as quite distinct from that of non-human entities in that it is mediated by tools, the most significant of which is language (Vygotsky 1978).

To be able to analyse complex interactions and relationships, Engeström (1987) proposed a research framework an activity system as the unit of analysis. This is represented in the triangle shown in *Fig 2* which has been widely used in social science research over the last two decades (Hasan 2001). Here the core of an activity is a dialectic relationship between subject (human) and object (purpose) where the subject can be individual or collective, as in a group or team working on a common project. The subject-object relationship which defines the activity is mediated by tools and community. Tools which mediate activities can be physical, i.e. technical or psychological such as language, ideas and business models. This is a two-way concept of mediation where the capability and availability of tools mediates what is able to be done and tools, in turn, evolve to hold the historical knowledge of how the communities behaves and is organised.

Fig 2. Engeström’s Activity Theory



It is always useful to explicitly identify the activities of the subjects (employees) of the study. In this case there are at least three:

- The activity of contributing to the TE
- The activity of accessing and using the content of the TE
- (for some) Participating in the study

Procedures - Design and conduct of the Q-methodology Data Gathering

The Concourse

The Concourse consisted of a general discussion around what people like or expect of a Wiki, in this case the Technology Encyclopedia. In a discussion that included members of the research team and the client representative, the participant group was asked “what would help you to contribute to the TE”, and their responses were used for the generation of statements.

The research contact with the employees occurred on two occasions. The first visit was a “brainstorming Concourse session, supported by an innovative group learning technology ZING Technology, as discussed above asked the participants, to supply their ideas for the topic as brief statements.

In all 57 statements were collected reflecting the range of views that the participants held on what would help them to contribute to the Wiki. To help us understand the statements, and to later understand the results of the sorts, the statements were reviewed by the researchers and broken down into seven descriptive categories as follows: *Usefulness, Ongoing, Acknowledgement, Time, Ease of Use, Security, Mainstream, Support, Exposure to Risk.*

The above are *descriptive* categories placed against all the statements and were later used to evaluate the meaning of the high positive and the high negative statements from each of the factors. The categories provide a very brief interpretation of the statements meaning. The meaning in greater detail is shown by going to the actual statements in *Fig 3.*

The table below provides the complete statement list from the Concourse and the number of the Statement and the category associated with each statement.

Fig 3: The 57 Statements of “What would help you to contribute to the Wiki?”

Category	Statement No.	What would help you to contribute to the Wiki?
Usefulness	1	If it was of more value
Usefulness	2	If I could see tangible benefits to customers
Usefulness	3	If customers could access the information
Usefulness	4	If it gave something back to the organization
Usefulness	5	If the objectives was made clear
Usefulness	6	If its usefulness was apparent
Usefulness	8	If I thought the information was useful to the users i.e. technologists
Usefulness	9	If I thought that customers wanted information added as part of their project
Usefulness	21	If the system captured info requests - so you could write on a topic for a known audience.
Usefulness	34	Knowing info demand hot spots
Usefulness	44	If guys in the control room could browse it in the middle of the night
Ongoing	7	Knowing that this type of system is going to be around " for the long haul" and not be a "flavour of the month"
Ongoing	29	If I thought the system wasn't going to be redundant in a couple of years
Acknowledgement	11	If contributions were recognized and rewarded
Acknowledgement	12	If contributions were tracked to me so that my boss can see my contributions
Acknowledgement	15	Acknowledgement of co-authoring and responsibilities for articles
Acknowledgement	18	If it had viewing stats to see who was interested in my additions
Acknowledgement	19	Knowing who is reading it
Acknowledgement	22	If it provided more feedback from readers of each page
Acknowledgement	23	If I thought someone was going to read what I wrote.
Acknowledgement	54	If it was linked to STI
Acknowledgement	56	If there was a Wiki newsletter
Acknowledgement	57	If there was a Wiki award
Time	25	If I had the time to contribute
Time	37	If another form of reporting was removed (eg technotes so this becomes the new format)

Ease of Use	17	If it told me what to when I get stuck or don't know what to do
Ease of Use	26	If a faster server was provided (multi second updates, lost pages on preview)
Ease of Use	28	If I had a better method to add images
Ease of Use	30	If it accepted dot points/not essay
Ease of Use	32	If I could easily get attachments in right format before entering
Ease of Use	35	More logical structure to location of topics
Ease of Use	36	If it provided support for equations, I cannot put (in any reasonable form) all of the pertinent information into the wiki
Ease of Use	40	If the system allowed direct entry of existing data without the need to re-format
Ease of Use	41	If I had an easier to use, simpler interface
Ease of Use	42	Simple - the kiss theory
Ease of Use	43	Easier more logical access
Ease of Use	52	Integration with a JIRA type issue resolution system so such info is automatically built into the wiki
Security	27	If I could use it in focus groups with limited team members
Security	31	If confidentiality issues are resolved
Security	33	If it had an improved authentication process
Security	38	If it provided better security is provided
Security	55	If the managers allowed and supported more open sharing of sensitive information
Mainstream	13	If it had a high priority
Mainstream	14	My professional pride
Mainstream	48	If it was the primary source of information storage
Mainstream	49	If it was universally regarded as a necessary job function
Mainstream	51	If there was a higher level of commitment to wiki from management
Support	22	If we went completely electronic and stayed away from paper e.g. paperless office
Support	39	If it had a specialist entry person / editor
Support	45	Having people who could capture information for me as its produced
Support	47	If there were specific requests for information and individually allocated to answering it
Support	50	If there was someone to maintain it
Support	53	If it had someone managing it and asked people to contribute specific areas
Exposure to Risk	10	If it provided the ability to make anonymous entries
Exposure to Risk	16	If I knew it wouldn't make me redundant
Exposure to Risk	24	If I was not limited by my ability to contribute
Exposure to Risk	46	If I had more training and practice

The statements of themselves provide us with a wealth of information about the participant's views of the topic at hand.

The Sort

The second visit consisted of a Q sort where the statements collected in the previous activity were sorted in accordance with the instructions "the extent to which they agreed or disagreed with the statements." A "forced sort" methodology was applied where each statement need to be placed in one of the provided spot squares on the Q Grid. In all thirty five employees and one research assistant participated in the sort.

The sorts were held in several groups on a single day. The data from the sorting procedure was followed by process of factor analysis. The process involves correlation and by-person factor analysis where the analysis is performed not by variables, such as traits, or statements, but rather by persons, where people correlate to others with similar views based upon their sorts. Thus the individuals are not groups by traits such as age, gender, or years of experience, but upon the groupings of their expressed opinions. 18 of the 36 participants sorts (50%) were accounted for in the three opinion types (called factors). The remaining 18 did not show any significant correlation with these three factors. In Q Methodology, an understanding of the participant's viewpoint is derived from an examination of the factor statements are sorted. The three factors (opinion types with reference to contributing to the TE) were titled as shown below in figure 4.

Fig 4: 18 of sorts in 3 factors

Factor Number	Factor Names	Sorts in each Factor
1	Corporate Knowledge Worker (CKW)	7
2	CKW with Customer Focus (Reflected Negative Factor)	4
3	Main Stream View (Reflected Negative Factor)	7

Factor 1 – “Corporate Knowledge Worker” (CKW)

The following section includes the high agree (positive) and the high disagree (negative) statements from each of the Factors, as well as the Factor scores, which indicate the relative level of the statements.

The reason for viewing the statements in this form is to allow us to see both the relationship among the high positive statements, and among the high negative statements and the contrast between them. This comparison is done with each of the Factors in turn so as to allow for a more rigorous examination of the Factors, both individually and in comparison with each other.

The following statements are the strongest agreement statements for Factor 1; the ones following these are the strongest disagreement statements. For Factor 1, the following ten (10) statements were given the highest weighting:

Fig 5: Factor 1 - Strongly Agree Statements

No.	High Positive Statement	Z-Values	Category
29	If I thought the system wasn't going to be redundant in couple of years	2.064	Ongoing
6	If its usefulness was apparent	1.595	Usefulness
2	If I could see tangible benefits to customers	1.539	Usefulness
1	If it was of more value	1.520	Usefulness
25	If I had the time to contribute	1.520	Time
7	Knowing that this type of system is going to be around "for the long haul" and not be a "flavour of the month"	1.388	Ongoing
40	If the system allowed direct entry of existing data without the need to re-format	1.351	Ease of use
20	If I thought someone was going to read what I wrote	1.295	Usefulness
30	If it accepted dot points/not essay	1.051	Ease of use
32	If I could easily get attachments in right format before entering	1.051	Ease of use

For Factor 1, the following ten (10) statements were given the lowest weighting:

Fig 6: Factor 1 - Strongly Disagree Statements

No.	High Negative Statement	Z-Values	Category
16	If I knew it wouldn't make me redundant	-1.013	Exposure to Risk
11	If contributions were recognized and rewarded	-1.032	Acknowledgement
33	If it had an improved authentication process	-1.220	Security
12	If contributions were tracked to me so that my boss can see my contributions	-1.257	Acknowledgement
19	Knowing who was reading it	-1.370	Acknowledgement
10	If it provided the ability to make anonymous entries	-1.426	Exposure to Risk
27	If I could use it in focus groups with limited team members	-1.539	Security
57	If there was a Wiki award	-1.782	Acknowledgement
44	If guys in the control room could browse it in the middle of the night	-1.895	Usefulness
56	If there was a Wiki newsletter	-2.008	Acknowledgement

The following statements are important, as they are effectively unique to Factor 1, as they “distinguish” Factor 1 from the other Factors based on their position in Factor 1 relative to their position in the other Factors. Note, in the case of statements 10 and 16, they are in

strong disagreement in Factor 1 and largely neutral for the other Factors. Yet, each distinguishes this Factor from the others.

Fig 7: Factor 1, 9 items distinguish Factor 1 from all other factors

No.	9 items distinguish Factor 1 from all other factors (Reflected for Factor 2 & 3)	Factor 1	Factor 2	Factor 3
6	If its usefulness was apparent	4	2	1
10	If it provided the ability to make anonymous	-3	-3	-4
16	If I knew it wouldn't make me redundant	-2	-2	-4
21	If the system captured info requests - so you	2	3	2
25	If I had the time to contribute	3	4	4
27	If I could use it in focus groups with limited	-3	-1	-1
44	If guys in the control room could browse it in	-4	-2	-2
56	If there was a Wiki newsletter	-4	-4	-1
57	If there was a Wiki award	-3	-4	-3

Factor 1 contains the statements most aligned with a good corporate knowledge worker - concerned with the value and usability of the TE.

The main concern of the individuals on this factor is with the ongoing use/status/reliability of the TE. The other positive statements reflect a desire for ease of use and having feedback on its use by clients. The negative statements indicate that they are not concerned about acknowledgement, awards and job security.

This factor was strongly represented by Manager, Scientist and Principal Technologist.

Fig 8: Factor 1 – 7 Participant’s characterised

Participants	Gender	Age Ranges	Occupation
5	Male	51 – 60	Manager
22	Male	41 – 50	Scientist
24	Male	51 – 60	Manager
27	Male	51 – 60	Principal Technologist
28	Male	51 – 60	Unknown
31	Male	41 – 50	PRS
33	Male	51 – 60	PTO

Factor 2 – Reflected (Negative Factor) CKW with Customer Focus

The following section includes the high agree (positive) and the high disagree (negative) statements from each of the Factors, as well as the Factor scores, which indicate the relative level of the statements.

The reason for viewing the statements in this form is to allow us to see both the continuity among the high and positive statements, and among the high negative statements and the contrast between them. This comparison is done with each of the Factors in turn so as to allow for a more rigorous examination of the Factors, both individually and in comparison with each other.

The following statements are the strongest agreement statements for Factor 2; the ones following these are the strongest disagreement statements. For Factor 2, the following nine (9) statements were given the highest weighting:

Fig 9: Factor 2 - Strongly Agree Statements

No.	High Positive Statements (Reflected)	Z-Values	Category
4	If it gave something back to the organization	1.995	Usefulness
25	If I had the time to contribute	1.448	Time
21	If the system captured info requests - so you could write on a topic for a known audience.	1.408	Support
31	If confidentiality issues are resolved	1.215	Security
3	If customers could access the information	1.201	Usefulness
1	If it was of more value	1.188	Usefulness
2	If I could see tangible benefits to customers	1.161	Usefulness
5	If the objectives was made clear	1.128	Usefulness
8	If I thought the information was useful to the users' i.e. technologists	1.121	Usefulness

For Factor 2, the following nine (9) statements were given the lowest weighting:

Fig 10: Factor 2 - Strongly Disagree Statements

No.	High Negative Statements (Reflected)	Z-Values	Category
24	If I was not limited by my ability to contribute	-1.101	Exposure to Risk
16	If I knew it wouldn't make me redundant	-1.188	Exposure to Risk
45	Having people who could capture information for me as its produced	-1.368	Support
39	If it had a specialist entry person / editor	-1.448	Support
29	If I thought the system wasn't going to be redundant in a couple of years	-1.415	Ongoing
10	If it provided the ability to make anonymous entries	-1.502	Exposure to Risk
54	If it was linked to STI	-1.515	Acknowledgement
56	If there was a Wiki newsletter	-1.949	Acknowledgement
57	If there was a Wiki award	-2.276	Acknowledgement

The following statements are important, as they are effectively unique to Factor 2 as they “distinguish” Factor 2 from the other Factors based on their position in Factor 2 relative to their position in the other Factors.

Fig 11: Factor 2 - 3 items distinguish Factor 2 from all other factors

No.	3 items distinguish Factor 2 from all other factors (Reflected for Factor 2 & 3)	Factor 1	Factor 2	Factor 3
4	If it gave something back to the organization	1	4	-1
5	If the objectives was made clear	2	2	-2
54	If it was linked to STI	-1	-3	3

The Factor 2 also reflects the views of the CKW and adds to this a focus on customers. In this factor there is concern and a desire for assurance, that confidentiality issues will be resolved and that the objectives be made clear, i.e. tangible benefits of the TE. The negative statements showed a disregard for additional rewards or acknowledgement. They were not concerned with acknowledgement, publicity, or any possible negative impact on their job security.

This factor had again a spread of people who strongly represented it including an engineer, a scientist, librarian and a university student.

Fig 12: Factor 2 – 4 Participant’s characterised

Participants	Gender	Age Ranges	Occupation
3	Unknown	41 – 50	Research Engineer
6	Unknown	41 – 50	Senior Research Scientist
34	Unknown	41 – 50	Librarian
36	Female	20 – 30	University Student

- Negative Factors are a reflection of the views held by the respondent’s on those factors.

Factor 3 – Reflected Negative Factor - Main Stream View

The following section includes the high agree (positive) and the high disagree (negative) statements from each of the Factors, as well as the Factor scores, which indicate the relative level of the statements.

The reason for viewing the statements in this form is to see both the continuity among the high and positive statements, and among the high negative statements and the contrast between them. This comparison is done with each of the Factors in turn so as to allow for a more rigorous examination of the Factors, both individually and in comparison with each other.

The following statements are the strongest reflected agreement statements for Factor 3; the ones following these are the strongest reflected disagreement statements. For Factor 3, the following five (5) statements were given the highest weighting:

Fig 13: Factor 3 - Strongly Agree Statements

No.	High Positive Statements (Reflected)	Z-Values	Category
25	If I had the time to contribute	1.752	Time
49	If it was universally regarded as a necessary job function	1.700	Mainstream
54	If it was linked to STI	1.607	Acknowledgement
51	If there was a higher level of commitment to wiki from management	1.246	Mainstream
7	Knowing that this type of system is going to be around "for the long haul" and not be a "flavour of the month"	1.129	Ongoing

For Factor 3, the following three (3) statements were given the lowest weighting:

Fig 14: Factor 3 - Strongly Disagree Statements

No.	High Negative Statement (Reflected)	Z-Values	Category
9	If I thought that customers wanted information added as part of their project	-1.002	Usefulness
10	If it provided the ability to make anonymous entries	-1.433	Exposure to Risk
16	If I knew it wouldn't make me redundant	-1.677	Exposure to Risk

The following statements are important, as they are effectively unique to Factor 3 as they “distinguish” Factor 3 from the other Factors based on their position in Factor 3 relative to their position in the other Factors. Note, in the case of statements 7 and 29, they are in strong disagreement in Factor 3 and largely neutral for the other Factors. Yet, each distinguishes this Factor from the others.

Fig 15: Factor 3 - 4 items distinguish Factor 3 from all other factors

No.	4 items distinguish Factor 3 from all other factors (Reflected for factors 2 & 3)	Factor 1	Factor 2	Factor 3
7	Knowing that this type of system is going to be around "for the long haul" and not be a "flavour of the month"	3	-2	3
15	Acknowledgement of co-authoring and	-2	2	-2
26	If a faster server was provided (multi second	-1	1	-3
29	If I thought the system wasn't going to be	4	-3	3

Factor 3 wants the TE to be “mainstream” and acknowledged as an ongoing part of their work. It contains the individuals whose statements are both concerned about their status, how they will be acknowledged and whether the TE will fully supported by management. They are not concerned with being made redundant or being able to make anonymous entries.

This factor was strongly represented by Senior Engineer’s and Senior Research Scientist’s.

Fig 16: Factor 3, 7 Participant's characterised

Participants	Gender	Age Ranges	Occupation
1	Male	31 – 40	Senior Research Scientist
9	Male	41 – 50	Senior Mech. Engineer
17	Unknown	Unknown	Principal Research Scientist
18	Male	41 – 50	Senior Research Engineer
19	Male	31 – 40	Unknown
21	Male	51 – 60	Senior Research Engineer
23	Unknown		Senior Research Engineer

* Negative Factors are a reflection of the views held by the respondent's on those factors.

Discussion of Results

The results of this study can be seen as twofold (1) a tangible set of Factors representing 3 different clusters of employees, each with similar views of the TE, and (2) a less tangible outcome of an **increased engagement** in the TE and more understanding of its value coming out of the activity of group discussions in the Q-methodology concourse. The tangible outcomes are *varying combinations* of opinions (Valenta, & Wigger, 1997) expressed by the group of participants. The resulting typology of the study revealed groupings of similar opinions in this case a typology of three opinion groups, i.e. Factors, was identified. The *factors* represent clusters of participants with similar opinions.

From an inspection of the statements that distinguished each factor it was the interpretation of the researchers that these could be described as follows:

Factor 1: contains the individuals whose statements are most aligned with a progressive 'corporate knowledge worker'- concerned with the value in terms of its usefulness and the ease of use of the Technology Encyclopedia

Factor 2: share a number of the views of those expressed in Factor 1, the corporate knowledge worker, -concerned with its value in of its usefulness plus this factor has a strong customer focus in its selection of "usefulness" statements. (*NOTE this is a reflected negative factor. *Pg 11)

Factor 3: contains the individuals whose statements are both concerned about acknowledgement, (how they will be acknowledged), and how mainstream the TE is whether it will fully supported by management. (*NOTE this is a reflected negative factor. *Pg 12)

The results of the Q-analysis shows that there is no "one size-fits all" view of the TE and that any way forward should take this into account. Readers of this paper are advised to make their own interpretation of the issues that bring together the set of statements in each of the Factors.

It is clear that the list of statements includes a number of informative views that will assist in the development of the TE. The concerns identified in the study could be pursued by undertaking interviews with employees representing the factors and by soliciting feedback from management of the client organisation.

An Activity Theory interpretation of the research activity is that the Q-method study has been an intervention in the work context of BSR. While there are tangible outcomes in the list of statements and the 3 clusters resulting from the factor-analysis, the process of the research

has already added to the engagement of the members of the BSR TE-users community. This process has provided them with the opportunity to enter into thoughtful discussion of what they want from the Wiki technology and as such would have been a useful contribution.

Conclusion and Future Research

Q- Methodology is shown to be useful as an action research methodology as well as to an investigative method. Q methodology is particularly effective in that it permits the systematic study of subjectivity. In addition as shown in this study, its use can also contribute to activities of community building, open discussion, reflection, individual decision making and provide outcomes that can guide the development and use of knowledge building technologies. Activity Theory has been overlaid on interpretation of results as it provides a language to describe the less tangible outcomes of the research. The outcomes of the Q-study, although limited to one sort topic in effectively one setting, did provide the opportunity for the participants to experience the range of activities provided for in the operational use of the methodology. Interviews with participants although not held in this pilot study would be a suggested future research activity.

These interviews would allow for further clarification of the views from representatives of each of the three Factors. Wider topics could be canvassed through follow-up discussion and for development of associated sets of statement. Associated sorts can be carried out at various intervals throughout a study. It would also be fruitful if BSR employees could sort the same set of statements used in this study after a set period of time to ascertain whether their views had shifted.

This study found a group of participants who were confident enough to express their concerns about the use of the technology and who through their contributions to the discussion and contribution to the discourse and in their individual decisions as expressed in the sorts have given us an informed way forward with the development of the Technology Encyclopedia. Now while these results are preliminary, they strongly indicate the ability and readiness of the participants to contribute to the enhancement and thoughtful development of the Technology Encyclopedia.

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Doing It Together: Citizen Participation In The Professional News Making Process

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Abstract

This paper looks at how mainstream media are currently reacting to the trend of citizen media. In order to look beyond the hype and high expectations about user generated content, we first try to put the debate on citizen and participatory journalism in context. We argue that the revived interest in participatory journalism is the result of both external developments in society and internal evolutions in journalism. Next, we analyze these developments in four European countries – Belgium, Finland, Germany and Spain – in order to identify similarities and differences that hint at the (professional, organizational, socio-cultural and economic) factors influencing the evolution of participatory journalism. Data collected suggests that despite of the differences in context, media in any of the four countries tend to develop very limited opportunities for audience participation. The professional culture of journalists is suggested as the main factor preventing the development of participatory projects, while marketing and business strategies somehow push for the exploration of such proposals.

Introduction

Back in the late nineties it was widely discussed that professional journalism was to encounter a serious challenge from rapidly spreading forms of online communication. Global publishing became an option for masses that had so far been relegated to the role of passive receivers in the communication scene dominated by professional news providers. This happened at the same time as especially newspapers' circulation was in a steady decline and the trust in the 'old' mass media was eroding.

While ten years later we can see that the established media still dominate communication flows, the challenge remains, and to a certain extent the debate has revitalised in the past few years. Changing media consumption patterns – especially the increased use of interactive

media among young people – and the continuing diffusion of the Internet and weblogs in particular fuelled optimistic accounts on democratic participation and active citizenship. Authors like Bowman & Willis (2003) and Dan Gillmor (2004) describe how, on the Internet, the people themselves become the media. In contrast to traditional media, blogs and other community-driven media are characterised by a fundamental convergence of the roles of content producers and consumers, as every user has the opportunity to both consume and create content. Axel Bruns (2005) has coined the term ‘produsage’ to refer to this blurring line, while Gillmor (2004: 136) speaks of the “former audience” to stress that the public should no longer be regarded as a passive group of receivers.

So far, the literature on online participatory media has primarily focused on the weblog phenomenon (see e.g. Lasica, 2003; Matheson, 2004), and collaborative online news sites, including Indymedia, OhmyNews, Slashdot, Wikinews, Kuro5hin and Plastic (see e.g. Bruns, 2005; Platon & Deuze, 2003; Atton & Meikle, 2006). While all these examples were born outside or in the margins of the existing media sphere and emerged ‘from the bottom up’, the established media business seems to be increasingly affected by the trend (or hype) of collaborative citizen media. Traditional media, and newspapers in particular, are currently experimenting with participative forms of content production in the hope to connect more effectively with changing usage patterns and the ‘real’ needs and preferences of their public. The World Association of Newspapers, for instance, regards citizen journalism as one of the major challenges to professional newsrooms in 2006 (WAN, 2006).

In this paper, we will analyse how mainstream media are currently reacting to this trend of citizen media. In order to look beyond the hype and high expectations about user-generated content, we first try to put the debate on citizen and participatory journalism in context. We argue that the revived interest in participatory journalism is the result of both external developments in society and internal evolutions in journalism. Finally, we will analyze and compare these developments in various European countries in order to identify similarities and differences that hint at the factors influencing the evolution of participatory journalism.

1. External context: Journalism in a participatory culture

Citizen media are not a new phenomenon. In fact, throughout the second half of the 20th century, various ‘new’ media have been welcomed for their presumed emancipatory and democratic potential. In the 1960s, 1970s and 1980s, local talk radio stations, pirate radios, video artists and other forms of community-driven media started to challenge the dominance of established commercial mass media. Participation and interaction were central elements in the logic of these ‘alternative media’, which mostly had an activist nature and a clear commitment towards their community. In 1983 Denis McQuail introduced the theoretical concept of ‘democratic-participant’ to capture the ideas of the “*alternative, grass-roots media that expressed and looked after the needs of citizens*” (McQuail, 2000: 160).

To a certain extent, it is clear that much of the early excitement about the democratic potential of the Internet in the 1990s echoes ‘old’ ideas about the emancipatory power of new media. However, for the first time in history, the Internet enabled *every* user – not only the ones capable to afford and use an expensive printing press, video camera or radio equipment – to become a producer of content and distribute it globally. “*While “independent”, “alternative”, and “DIY” media have long existed in many forms (...), one key to the Internet’s unique significance is that it provides the infrastructure necessary to facilitate the distribution of all*

forms of self-produced media to a potentially far-flung audience. Linked together via the Internet, scattered individuals and small groups with common interests can add up to a sizeable audience for self-produced media." (Croteau, 2006: 341).

While public's digital media literacy has steadily increased, and while so called new media has matured and become part of everyday life in developed Western societies, the weblog phenomenon has represented a leap in network communication. Blogging software, that made it even more simple to publish content on the web, marked the beginning of a rapid growth of user-generated content, that is now at the heart of many of the most popular web services on the Internet, such as YouTube, Flickr, Wikipedia, Myspace, and so on. Contrary to the early (offline) citizen media, we note that most of these online services do not have activism intentions. By this we mean that their main *'raison d'être'* is not, or not only, to challenge the dominance of traditional media as such, but rather to provide users with the platforms and tools needed to create social networks online. Enabling interactivity is the key element; enhancing democratic participation and active citizenship, in the political sense of the word, can be a positive 'effect', although overly optimistic accounts on the relationship between the Internet and democracy have already been countered several times (see e.g. Jenkins & Thorburn, 2003). Still, many authors are convinced that blogs and the web services mentioned above herald a new digital era in which control shifts from the institutions to the users. One of the buzzwords to refer to this trend is 'Web2.0'. Tim O'Reilly (2005) coined the term Web 2.0 to refer to a new generation of web-based services that put emphasis on social networking, collaboration and participation. All these are key concepts to understand the real impact of today's "participatory media culture". In the definition of Henry Jenkins (2006: 3), the term 'participatory culture' "*contrasts with older notions of passive media spectatorship. Rather than talking about media producers and consumers occupying separate roles, we might now see them as participants who interact with each other according to a new set of rules that none of us fully understands.*"

Participation in this context goes beyond a purely political meaning of democratic participation, and has to be understood in a broader cultural sense. In this respect, some authors argue that understanding the participatory nature of the emerging digital culture requires a broader definition of the concept of 'citizenship'. Joke Hermes (2006), for instance, underlines the cultural dimension of citizenship, suggesting that people use popular media, including interactive media, to construct their citizenship in many ways that extend far beyond the notion of 'being informed'. Hermes' main argument, then, is that the Internet does not necessarily produce 'new' citizens, but it does provide for new citizen practices. These citizen practices are focused more on social rather than political participation, they may be rather incidental than structural, and they express the need for community, for sharing, bonding, connectedness and interaction. Mark Deuze (2006a: 68) acknowledges that participation, as it is expressed on the Internet, is to some extent "*voluntarist, incoherent, and perhaps solely fueled by private interests*", but it nevertheless defines what people expect from the media and how they use them to inform each other. If we accept that today's digital media culture is participatory in principle, Deuze (2006a) continues, mainstream media will have to adapt to this change. More specific, they will have to reconsider their role along the lines of the ideas expressed by authors like Dan Gillmor (2004) and Axel Bruns (2005), who herald "*new roles for journalists as bottom-up facilitators and moderators of community-level conversations among citizens rather than functioning as top-down storytellers for an increasingly disinterested public*" (Deuze, 2006b: 275).

2. Internal context: Participation in journalism

The revived interest in participatory journalism also relates to ongoing debates *inside* the profession about the journalists' relationship towards the audience. In the history of journalism, different views and conceptions have emerged of what journalism is and/or what it ought to be. Yet, there does not exist one universally accepted normative framework that defines the role of journalism in democracy.

Michael Schudson (1998) sees at least three main 'models of journalism': the Trustee Model, the Market Model and the Advocacy Model. As Schudson (1998: 135) argues that in the United States the Advocacy Model has become "*essentially extinct in general circulation press*", the same observation can be made in Europe. Due to tendencies of depoliticization, secularization and liberalization, also in Europe the party press and other forms of advocacy journalism have mostly disappeared or migrated to the periphery of alternative media and community or minority publications. This means that in mainstream journalism, two main – though to a large extent conflicting – models of journalism exist. In the Trustee Model, journalists are seen as professionals who decide what news citizens should know to act as informed participants in democracy. Although the Trustee Model is being criticized because of its elitist, top-down and paternalistic character, it is fair to say that it still dominates professional and scholarly literature on journalism, and defines the conventional framework of journalism education (Dahlgren, 1992; Zelizer, 2004). At the same time, the Trustee Model is increasingly losing influence in favour of the Market Model, which stipulates that "*journalists should please audiences or at least those audiences that advertisers find attractive (...) Consumer demand is the ultimate arbiter of the news product.*" (Schudson, 1998: 135). Since the nineties, the Market Model has received increased attention in scholarly literature (e.g. McManus, 1994; Dahlgren & Sparks, 1992).

Both dominant models of journalism have come under fire, however, for failing to fulfil its democratic role and re-establish public's trust in the media. Especially in the US in the mid-nineties, several authors argued that it was high time for the mainstream press to reconnect with the public, not only for the future of journalism as such, but for the sake of democracy in general. Basically speaking, the critique was that the Market Model treated people merely as customers instead of citizens, by giving them what they want instead of what they need, whereas the Trustee Model was too much detached, too elitist and alienated from daily public life as it is perceived by the people. Authors like Rosen (1999) therefore put their hope in the emergence of the 'civic' or 'public journalism' movement. This movement originated from within the profession in the early-nineties, when some regional newspapers in the US started to experiment with involving the audience in the news process. In the following years, the idea(l)s of public journalism rapidly spread and the concept became widely discussed in both scholarly and professional literature, first in the US, but later on also in Europe and other parts of the world.

Yet, there appears to be a discrepancy between the theoretical attention paid in literature to civic/public journalism and the real impact it has (had) on journalistic practice. After a review of 47 evaluative studies on public journalism in the US, Massey & Haas (2002) concluded that public journalism has had only a modest, if any, influence on journalists' routines and attitudes. According to the authors, the most important contribution of public journalism does not lie in the enhancement of citizen participation, but rather in the fact that it ignited the discussion on the role of journalism in democracy and its commitment to the public. It is fair

to say, though, that the overall impact of public journalism on mainstream journalistic practice should not be overestimated, neither in the US nor elsewhere in the world.

Denis McQuail (2000: 160) notes that the movement “*seems to have found not much of a following in Europe*”. According to McQuail, part of the explanation may lie in the fact that in European countries attention has focused more on the need to strengthen existing public service media and on the potential for harnessing new media to enhance democratic participation. Other authors relate the ‘impact’ of the public journalism movement to the degree of media competition and economic reasons. Axel Bruns (2004: n.p.), for instance, explains the low adoption of public journalism in the Australian mainstream press by saying that, compared to the US, media in Australia feel less “*competitive pressure to adopt public journalism approaches in order to distinguish one’s operation from other players.*”

Several observers have criticized public journalism for its reluctance to grant the public greater authority in the news process. Michael Schudson (1998: 137-138) calls public journalism conservative, as it still views journalists as the central agents who decide what news is and what people need to know to act as informed citizens in democracy. Public journalism “*does not remove control over the news from journalists*” (p. 137), and therefore “*stops short of offering a fourth model, one in which authority is vested not in the market, not in a party, and not in the journalist, but in the public*” (p. 138). Platon & Deuze (2003: 340) agree by saying that “*(t)he notion of ‘us and them’ is still used to describe the difference between journalists and citizens. The ‘us’ are professional journalists while the ‘them’ are the concerned citizens telling their stories to these reporters and editors. The public journalist is, in other words, still the gate-keeper.*” They add that a next step in moving journalism further in the direction of participation and interaction is most likely to be found on the Internet, where new forms of online journalism seem to emerge. As an example, they mention ‘open-source journalism’, that refers to a kind of journalism in which the control over the different stages of the news production process is shared with users. In an earlier account, Deuze (2001: n.p.) already referred to ‘open-source journalism’ as an “advanced form” of public journalism, because it involves the audience more actively in the news process, and thus balances the control between journalists and citizens.

The idea that public journalism seems to have entered a second phase, especially under influence of recent trends in online journalism, finds support in recent publications (e.g. Haas, 2004; Nip, 2006). In a review on the relationship between weblogs and mainstream media, Haas (2004) suggests that weblogs could foster a fourth model of journalism, one that he would label “public’s journalism” and that could be understood as a form of journalism ‘by and for’ the public.

Joyce Nip (2006) does not add a new term to the debate, but reviews some of the concepts that have been used in recent literature on participatory forms of journalism. She uses the degree and form of audience participation in the news process as a criterion to distinguish four models:

- Public journalism (as described above);
- Interactive journalism: this model refers to practices in online journalism, that use the Web as a platform for interactivity and discussion. Nip (2006: 217) notes that “*(a)s the involvement of the news users takes place after the news is published, the professional journalists are responsible for producing the news content for publication.*” In other words, interactive journalism is still produced only by professionals, but user feedback is facilitated from the moment on that the news is published.

- Participatory journalism: In this model, Nip (2006: 217) explains, “(u)ser contribution is solicited within a frame designed by the professionals.” Citizens are invited, in other words, to contribute actively in the processes of news gathering, selection, publication, commentary and public discussion, and all this is accomplished in collaboration and in interaction with professional journalists. Closely related variants of this model of participatory journalism are thought of in terms such as “open-source journalism” (cf. Deuze, 2001) and “networked journalism” (Jarvis, 2006).
- Citizen journalism: this term has become widely accepted to refer to the “act of citizens playing an active role in the process of collecting, reporting, analyzing and disseminating news and information” (Bowman & Willis, 2003: 9). A synonym is “grassroots journalism” (Gillmor, 2004), and also Haas’ (2004) understanding of the term “public’s journalism” can be posed under this heading. The main difference to ‘participatory journalism’ is that in citizen journalism the news making process is completely pulled out of the hands of journalists and left over to the people, who have become both producers and users of the news.

In spite of the sometimes confusing discourses and inconsistent use of the different terms, the rationale behind all these participatory models of journalism is that professional journalism is in need of a redefinition of its democratic role in a changing society. In their critiques on the top-down approach of the professional ‘journalistic gatekeeper’, the adepts of these ‘new journalisms’ argue that journalism should try to enhance citizens’ engagement with both the making and the use of news. Contrary to the models of public journalism and interactive journalism, however, the key argument in the latter two models is that it is no longer the journalist who should be considered as the central authority in the news making process, but rather the citizens themselves. Journalists should not only open up the news process, turn journalism from a lecture into a conversation with citizens and encourage citizens to participate in the different stages of the editorial news-making process. Above all, they should learn to acknowledge that they can no longer claim control over the gatekeeping process, but have to share this control with the public.

3. Participatory journalism in four European countries

In this section of the paper, we look at how participatory journalism is developing in four European countries: Belgium, Finland, Germany and Spain. In order to gain a better insight in the factors influencing the adoption of participatory elements in mainstream journalism in each of these countries, we try to reflect on the current media market structure; previous experiences with public journalism and interactive journalism (internal context); and the ways in which mainstream media are currently reacting on the trends of user generated content and citizen journalism (external context).

3.1. Belgium

Roughly analogous to the Belgian federal state structure, the media market is divided in the French-speaking community and the Dutch-speaking region of Flanders. Both regions have a distinct media market with its own specific structure, policy and culture. The newspaper market in Flanders is controlled by three media groups: Corelio, Concentra and De Persgroep Publishing, whereas the main players in the French-speaking community are Rossel, IPM and Mediabel. The magazine sector is dominated by Roularta, De Persgroep Publishing and the Finnish Sanoma company. Like many other European countries, Belgium has a strongly

developed public service broadcasting system, with both RTBF (French-speaking community) and VRT (Flemish community) being the major players in their respective radio and television market (De Bens, 2006).

In this environment, dominated by public broadcasters and a handful of newspaper and magazine publishers, media companies are generally following international trends rather than take the lead in it. Moreover, innovations in newspaper publishing tend to be much more focused on technological innovation rather than on newsroom experiments with new forms of journalism (Paulussen, 2005, 2006). Consequently, public journalism has not received much attention from mainstream media. In fact, the concept and the ideas behind it have been hardly discussed in Belgium in academic or professional literature. The fact that most of what has been written about public/civic journalism in Dutch comes from The Netherlands (e.g. Drok & Jansen, 2001), illustrates that the movement did not find many adepts in Belgium. In 2002, there was a project funded by the King Baudouin Foundation, in which 22 media outlets, both online and print titles, experimented with participatory enhancing practices in journalism. Although both the researchers and the journalists that were involved in this project were quite positive about the outcome of these ‘civic journalism’ experiments (see Grevisse & Carpentier, 2004), the project did not receive much of a following in the next years. On special occasions, for instance in the approach of elections, newspapers sometimes take initiatives that can be labelled as ‘public journalism’ (e.g. organizing a political debate, moderating discussion forums, giving users the opportunity to ‘chat’ for one hour with an important politician, etc.), but in general, the ideas of public journalism have not had much of an impact on the logic of the mainstream press in Belgium.

Like in most countries, the Belgian online media market is dominated by traditional media players. Consequently, online journalism in Belgium did mainly develop within the newsrooms – and thus within the logics – of traditional media. Although the findings of surveys among Dutch and Flemish online journalists in 2000-2001 provided some indications as if online journalists might be more open towards ideas of interactivity (Deuze & Paulussen, 2002), reality has proven that in practice online journalists tend to uphold similar norms and professional values as their print colleagues (De Bens et al., 2003; Paulussen, 2004). If we want to consider whether mainstream media are likely to adopt participatory elements in the news making process, we must not only look at journalists’ self-perceptions about their role and commitment towards the public, but we should consider organizational aspects as well. Like in other countries, studies in Belgium have pointed at small-sized newsrooms and lack of resources as major explaining factors for the low or non-adoption of interactivity in online journalism (Paulussen, 2004; Beyers, 2005).

In recent years, in the context of the Web 2.0 hype, mainstream media in Belgium are showing an increased interest in user generated content and citizen participation. A leading role is played by the public broadcaster VRT, which set up a platform called *16+*, where people can upload their self-produced video material. VRT is also quite actively experimenting with other forms of online community-building through weblogs and social sites such as myspace. Important to note, however, is that these initiatives try to increase public’s loyalty towards the broadcaster station rather than to involve citizens in the *news* process. Most of VRT’s experiments with user generated content are, in other words, situated outside journalism.

The media company that is putting the most effort in opening up the news process for user contribution, is Concentra. In 2006, this media company, that focuses its activities mainly on

the province of Limburg, launched a platform for citizen-generated news content called *HasseltLokaal*. The platform is maintained by an editorial team of 15 citizen reporters, who work as volunteers covering local news from around the city of Hasselt. While one year after its launch, *HasseltLokaal* is considered as a successful participatory journalism experiment, one can still wonder to what extent media can find a sufficient number of dedicated and motivated citizen journalists, who are not only prepared but also trained and equipped to contribute to the news production. It is already apparent that the maintenance of platforms like *HasseltLokaal* requires more than just the provision of the technology and tools. It also requires moderation, coordination and even training of amateur journalists (Vranken, 2007).

A final note should be made on the small scale of the country's media market. Internet usage in Belgium, a country of about 10.5 million people, has risen to 58% in 2005 (Statistics Belgium, 2006). Not all of these people, of course, are online news consumers (Beyers, 2005). Furthermore, although exact figures are not available, it is clear that the blogosphere is only a small fraction of the total online media ecology. Research is needed to investigate the structure and significance of the Belgian blogosphere and other citizen-generated news media, but it is safe to say that its impact in terms of gatekeeping and agendasetting is still limited.

3.2. Finland

Two features in the media landscape of Finland are particularly noteworthy when contextualizing participatory journalism. One is the press structure that is characterized by strong regional newspapers. The country of about 5.2 million people has about 100 newspapers (about half of them dailies), but excluding two tabloid-ish afternoon papers and to some extent the biggest newspaper, the Helsinki-based Helsingin Sanomat, about all general newspapers have either regional or even local basis for their circulation and advertising. More importantly, newspapers have manifestly attached themselves to their respective constituencies by proclaiming to be part of those communities, but adhering to the principles of professional journalism. On top of that, many of newspapers, although operated as businesses, had political affiliations (mostly with center or right-wing parties) till 1970s and even later. Thus, Finnish newspapers have a tradition of being "committed to a cause" with regards to civic society instead of being mere information mediators (Lehto 2006).

The other substantive feature is the strong tradition of public broadcasting in Finland. Although the Finnish Broadcasting Corporation (Yleisradio, YLE) has met severe competition by private companies in both television and radio fields, it still is most important single operator in broadcasting, and the values of public service are largely shared in the country. For instance, the two national tv-companies (WSOY-Sanoma owned Nelonen, and Swedish Bonnier owned MTV3) make their point of investing in high-quality news and current affairs programmes.

Consequently, there was somewhat fertile ground to which the ideas of public journalism were introduced in 1990's. It was the academics who in Finland first paid attention to this movement, but the media soon became interested. One of the factors was that at that time the media, especially newspapers, suffered simultaneously from declining circulations and assumed threat of the Internet. (Heinonen 1999) Several research and development experiments on practical implementation of public or civic journalism have been carried out since 1990s with aims to enhance public's participation in setting the news agenda of the media. One can say that the idea of allowing "ordinary citizen" to have more say in journalism beside the established elite sources has strengthened, but in practical terms this

often means positioning the citizen merely as an incidental commentator of issues decided somewhere above. On the other hand, in some newsrooms the role allowed for citizens has become more prominent in shaping journalistic content. (Ahva 2003, Högmander 2005) However, one should note that along public journalism experiments, the media has made use of more business-oriented strategies, such as consumer studies, for becoming better aware of needs of its audiences. The risen status of the reader is a result of both of these strategies.

With regards to online journalism, the Finnish media encountered the Internet in 1990s much the same way as other Western media. On the one hand, there was the fear of losing the audience to the Net, and on the other hand, there were hopes of gaining new possibilities by going online. (Heinonen 1999, Mäkinen 2004) Interactivity was one of the key-words, but in practice the two-way communication possibilities were scarce in the Finnish online media for a long time. Partly this was due to technological incompetence and unclear legislation (issues of responsibility of contents), but also the prevailing journalistic culture affected to this. In fact, in the early days of the Internet Finnish journalists considered readers' e-mails more a nuisance disturbing "real" work, although in principle the possibility to foster relationships with the audience was appreciated (Heinonen 1999, Heinonen & Kinnunen 2005). The situation has changed, but slowly. In early 2000s among Finnish newspapers, for instance, many made hardly any use of the interactive features of the Net, although a number of them maintained regular and even extensive readers' discussion forums, invited readers to comment, and send in news tips and even news pictures from readers' camera phones. (Kivessilta 2005) Nowadays it is not irregular to find extracts of newspapers' online forums' discussions taken to the printed versions, and there has been even a couple of cases of readers' news pictures making to the front-page of a newspaper. On tv, the SMS and e-mail input from viewers during talk-shows is also a quite regular feature.

The weblog phenomenon has had a significant effect on Finnish online media mostly in that blogs have appeared as a new journalistic genre in the news media. A number of journalists have established a media blog, i.e. a blog that is perhaps a more personal in style but nevertheless a regular part of the contents of a medium following its journalistic line. It is telling that not all of these media bloggers allow direct or even any commenting, but those that do have rejoiced for discovering such contacts with their readers. However, the suspicion or even ignorance towards the free, non-media, blogosphere is still a prevailing attitude of established media and professional journalists. For instance, during the Tsunami catastrophe at the turn of years 2004-2005, the Finnish media largely failed to use citizen blogs as their sources – although a Finnish citizen blog beat both media and official sources in delivering news of the incident (Itkonen 2007).

The rather slow acceptance of the interactivity of digital media by the Finnish news media is interesting when considering the quite high digital media literacy of Finns. The Internet penetration is high: In 2006, three of four Finns used the Net, and in the group under 40 years old, almost all uses it. (Statistics Finland, 2006) In addition, since 1990s both national and local Information Society policies have encouraged and facilitated projects which aim at active users of new media. As a result, there are a number of citizen online media, from rural media sites through neighborhood amateur reporters' publications to media criticism and expert blogs in the country. (Sirkkunen & Kotilainen 2004) Thus, there is basic digital competence on behalf of the public to become more active participant in the journalistic discourse when and if the media chooses to move to that direction.

3.3. Germany

Germany's media market is one of the biggest in the world, with a varied structure of news media offering content for an 80 million people audience. Due to the country's history, there is a strong public service broadcasting system (basically installed by the Allies after WW II), private broadcasting, and several hundred newspapers, most of them serving a local and regional market. However, just a few handful of large companies own most of these newspapers and broadcasters, so these large publishing houses and media companies (like Bertelsmann/Gruner & Jahr, Springer, Burda, the waz group, and in the broadcasting sector RTL, ProSiebenSat.1 etc.) strongly influence and push the media market development.

In this environment, public service journalism did not develop very well, though. As Lünenborg writes in a recent piece on the topic, "*the huge discussion on public journalism in the US virtually had no effect on Germany*" (Lünenborg 2005, 155; translated from the German original). There are many possible reasons – some of them might be directly attributed to the market structure itself:

- As said above, there are many local newspapers that already serve a community function, so there was probably not an urgent need for a reorientation in many of these smaller units. Weischenberg, Malik and Scholl note in their latest representative "Journalism in Germany" study that local journalists in Germany "*do have a less elitist occupational culture than other beats*" (2006: 110, translated from the German original), and "*try to integrate the audience and strengthen its importance*". While this might not be true civic journalism, this strong local tradition might have softened the urgency of implementing new forms of user oriented journalism.
- Furthermore, the big publishing houses seemed to be quite reluctant to experiment, after they spent a lot of money on videotex and online media, which did not prove (economically) successful in most cases. Actually, many of the bigger media companies did heavily cut down their online staff in the years after the new economy crash and during a phase of severe economic problems with high unemployment (which indirectly lead to shrinking newspaper sales and media spendings).
- Other reasons might lie in the mentality and culture of Germany (stronger reliance on state organization, less belief in privately organized activities), with a different community structure than the US (high density of population, living mainly in small or medium sized cities, many spare time activities organized in club structures etc.).

That said, there are some experiments with public journalism in Germany, for example the so called 'open channels' – TV stations that are open for any user to participate, supported by the state on the basis of a specific media legislation. However, they are not very successful in attracting anything but a very small audience.

In such a media environment, it does not come as a surprise that user participation in online media was not happily greeted by the mainstream media companies - they did not adopt this trend until fairly recently. Obviously, they were already struggling with converging newsrooms and cross media concepts (cf. Brüggemann 2002, Meyer 2005).

In the mean time, however, buzz words like 'weblogs' and 'web 2.0' have finally reached the German online market, too, and recently, media managers and chief editors seem to be more interested in the integration of communities – some people already talk about a new internet hype. User generated content instead of content produced by professional editors – that's a recipe tested by some mainstream media companies now, however not so much in their

‘flagship media’, but in separate publications. Examples include *jetzt.de* (an offspring of *Süddeutsche Zeitung*), *Sensation!* (*Tagesspiegel*), *Opinio* (*Rheinische Post*) and *Reader’s Edition* (developed by the *Netzeitung*, but sold in the meantime).

Still, there are some doubts about the true reasons for the adoption of user generated content in mainstream online media. It is not unlikely that the developments are labeled by the managements as ‘democratic’, ‘pluralistic’ and ‘trendy’, while they are primarily trying to lower the costs for professional editors by using ‘free’ content happily provided by users. The resulting damaging effects on the journalistic profession have been discussed lately, also in an ethical context, triggered by *BILD*’s (Germany’s largest tabloid) offer to buy (Paparazzi) pictures from ‘reader reporters’ for a minimal fee. Recent data on the development of the journalistic job market fueled the discussion: Weischenberg, Malik and Scholl’s (2006) ‘Journalism in Germany’ study indicates a shrinking number of full time journalists. For online journalism, Quandt et al. (2006) could show that there are many part time or even semi-professional journalist working in online journalism – and not all of them do this out of a participatory interest, but to earn their rent and food, struggling with several jobs (with one of them being journalism).

A related question concerns the motivation of the users to contribute to mainstream media or write blogs. While there are some high profile bloggers and citizen journalists that do offer journalistic content via their website or contribute original content to user driven media, most of the blog content are of a more private nature. A recent survey on German webbloggers supported a private – and sometimes narcissistic – motivation of most bloggers (cf. Schmidt, Wilbers, Paetzolt 2006; for an overview of research on blogs in Germany, s. also Neuberger, Nuernbergk & Rischke 2007). There are some prominent exceptions, though – most notably the *BILDblog*, a website that discusses and analyzes the mistakes of *BILD*’s coverage. Its main authors are journalists themselves, thus offering a journalistic critique function of journalism through a blog – with a notable number of users (usually, *BILDblog* is noted as the top ranked blog in Germany) who are also contributing content themselves.

That said, such forms would not be existing without mainstream journalism. So some doubts remain whether blogs and user generated content will be a large scale success story in Germany (like in the US), and whether the developments have to be discussed in the context of a useful and pluralistic evolution of journalism (s. also Neuberger 2006 a, b) – or rather in the context of an economically motivated de-professionalization of journalism.

3.4. Spain

The recent history of Spain, with the transition to democracy in the 1970s after a long dictatorship, has shaped the evolution of the media market and the public sphere (Gunther, Montero and Wert, 2000). In a market of 40 million people and three regional languages besides Spanish, a three-layered structure formed, with the locus for direct participation of the citizens in the media restricted to local initiatives during the 1980s and 1990s:

- Nation-state level: The quality newspapers, with sharp political partisanship, seen as natural as society learned to openly engage in public debate (Hallin and Mancini, 2004). However, their readership has always been low –around 35% in the late 1990s– and it has declined lately following international trends and the competition of free newspapers created in the 2000s (AIMC, 2006). Television has been the top news source for citizens, and after the public broadcasting monopoly opened up big multimedia conglomerates formed with the newspapers as the center. These national

media tend to be close to the political elites they report on, in a self-referential public sphere where the citizens are regarded as a passive audience that is just supposed to react to news and the influential op-ed articles of news editors (Borrat, 1989).

- Regional level: Especially in Catalonia, the Basque country, Galicia and Andalusia, regional media groups became leaders in their area of influence, with semi-autonomous dynamics in these smaller public spheres (Gunther, Montero and Wert, 2000). The logic here was also the same as in the nation-state level.
- Local level: During the democratic transition, in some regions community media initiatives were developed at a municipal and county level (Rodriguez, 2001; Moragas, Domingo and López, 2002). Based on the principles of a long-awaited freedom of expression and direct democracy, content was developed by amateur volunteers reporting on daily events of their communities. Most of these projects evolved into more professional structures to ensure stability, but this ended up leaving content production in the hands of journalists and citizens contributions tended to disappear from the projects.

The concept of public journalism has been largely ignored in Spain, probably because of the youth of a professional and democratic journalism in the country, and even though the criticisms of public journalism to the US media are mostly applicable to the Spanish case. The fact is that current proponents of participatory online journalism in Spain use US public journalism as a referent when looking to root their statements to solid arguments (Madariaga, 2006; Varela, 2005).

In the early 2000s, the global trend of the (re)activation of citizen participation both inside and outside the media also arrived to Spain, as if the Internet had connected this Mediterranean market to the pace of the Western world. Outside the media, anti-globalization and anti-war civic movements have used the Internet to organize and express their points of view (Atton, 2004). During the first phase of the war in Iraq, the self-organizing capabilities of civil society ended up influencing media coverage in becoming extremely critic to the war. Also, weblogs have rapidly developed as a self-publishing tool among Spanish netizens, and political debate is the main driving force. This is not to say that citizens have engaged into a dialogue on the policies of their governments, but rather a replication of the partisan dialectics of the national and regional media; building arguments to criticize the opponent are the main topic in the Spanish political blogosphere (Escolar, 2006).

Inside the media, data from a census of 58 Spanish media companies developing convergence projects (Domingo *et al.*, 2007) reported that only a third (22) were exploring some sort of audience participation. Most of the options framed audience as respondents to journalistic content: comments on news and on journalists' blogs were the prevalent developments. User-generated newsworthy materials (photos, stories, videos, blogs) were invited in some of the national newspaper websites, and only few of the regional and local websites had such features. The fact that national newspapers are now leading the development of audience involvement in the media in a country where in earlier decades this was circumscribed to local projects suggests that new factors need to be explored to understand current trends. Catalan online journalists in four case studies shared interactivity as one of the powerful online journalism utopias, even though they have mixed feelings about the benefits of audience participation (Domingo, 2007). Fierce competition among national Spanish news sites and the prevalent reference of US online media developments can explain why participatory journalism has been so quickly embraced at the national level.

ElPais.com (owned by Prisa, the editor of the main quality newspaper in Spain) has a section called “Yo Periodista”, paralleling CNN’s I Reporter. And the free daily *Qué!* hosts audience blogs on its website, promising that the best posts will be published in the print edition. Nevertheless, there is no evidence that these projects have redefined (for better) the work of the journalists in these media or fostered open discussion on public interest issues. ElPais.com representatives announced they have 12 editors solely devoted to filter user contributions in order to get rid of vandalistic and offensive submissions, even in news comments (Nafría, 2007). “There is a lack of participatory culture in Spain”, Nafría argued.

A further cautious note has to be made when discussing online participation. In Spain only 40% of the population uses the Internet regularly, connecting weekly or more often (INE, 2006). While among people under 25 usage increases to 71%, the low penetration rate in elder generations has not been solved by the multiple initiatives of national and regional governments. Castells *et al.* (2004) hypothesized that the Mediterranean social habits could explain this lack of interest of a big part of the population in going online, as outdoor life and face-to-face relationships were essential. However, the authors also found that those who were the most active Internet users were also those with bigger offline social networks and more engagement in public affairs and civic initiatives. Somehow, then, an elite of society seems to be the one taking advantage of the opportunities of online technologies, while the majority of citizens tend to be mere passive recipients of mainstream media political rallies.

4. Discussion: doing it together?

“‘Networked journalism’ takes into account the collaborative nature of journalism now: professionals and amateurs working together to get the real story, linking to each other across brands and old boundaries to share facts, questions, answers, ideas, perspectives. It recognizes the complex relationships that will make news. And it focuses on the process more than the product.” (Jarvis, 2006).

The country descriptions in this paper show that mainstream media in Europe are still far removed from this ideal-typical model of “networked” or participatory journalism. At the same time, however, trends in the four countries confirm that both external and internal developments in journalism have revived the debate on the role of the professionals and their publics in the digital era. From the outside, mainstream journalism is confronted with the emergence of a digital culture, in which users are more and more actively participating in the creation and publication of content. To some extent, these external developments have ignited the discussion inside the profession, also fuelled by the need to engage new audiences in an increasingly competitive environment.

Starting from these two observations from outside and inside the profession, this paper has looked at how participatory journalism is developing in four European countries: Belgium, Finland, Germany and Spain. The descriptions by the respective authors draw a somewhat sobering picture that stresses the sluggish adoption of interactivity in online journalism, on the one hand, and the moderate impact public journalism has had on existing models of journalism, on the other hand. In this respect, we could argue that the internal context in which participatory journalism is supposed to evolve seems to provide a lot of barriers for citizen participation in the news making process. In other words, the professional culture of mainstream journalism, which still favours a professional top-down approach, conflicts with

the external context, that heralds some optimistic promises of an emerging participatory media culture.

First of all, studies in each of the countries have shown that professional journalists are rather sceptical about interactivity with their users, and that they still like to think about the role of journalism in terms of the top-down model of trustee journalism. Secondly, the country reports point at several organizational factors influencing the (non-)adoption of citizen participation in the (online) news making process (e.g. lack of resources, deeply-rooted work routines, etc.). The paper also considered cultural aspects as explanatory factors influencing the spread of participatory journalism, suggesting, for instance, that the base on which the ideals of participatory journalism are being built is rather narrow as the large majority of citizens are still unlikely to play an active role in the news making process. Finally, critical remarks have been made about the market-driven rather than civic-oriented rationale behind mainstream media's experiments with user generated content and citizen participation.

Further research is needed to evaluate the nature and quality of audience participation in the cases when it is fostered. In "best practices" cases, an analysis of the structural changes in work organization, routines and professional values that have enabled relevant participation will be useful to assess to what extent participatory journalism can become a widespread practice in the media and what can be its consequences for the quality of journalism and the public sphere. Analytical models like the one proposed by Bruns (2005) under the label of *gatewatching* can be useful for such an approach, even though more operational categories are needed to describe the extent and locus of participation. Such a model should enable to locate the moments in the news production process that are being redefined, as well as those that remain intact, and trigger more specific hypotheses to explain the reasons for the apparent reluctance of mainstream media in the development of participation spaces.

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Conceptualising Online News Use

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Abstract

This paper is based on the first results of the FLEET-project (Flemish E-publishing Trends), started in March 2006 and focussing on the transition of newspapers to online news sites. The scope of this paper is to investigate the existing concepts used in media studies to analyse the use of news and to refine and complete these concepts in order to develop an up-to-date conceptual framework for the study of online news. The starting point is the changing relationship between newspapers and their readers. The traditional roles of newspapers i.e. agenda-setter, watchdog and content provider are revisited in relation to the possibilities online media offer their readers in terms of participation: share, rate, tag, comment, produce news, etc. As newsreaders become news users they take over these roles or parts of them from the newspapers and mass media in general. By looking at this changed relationship concepts like participation, trust, community, lean-back/lean-forward and prosumer emerge as important differentiating factors and hence are explored as relevant concepts for the study of online news. In order to come to these findings, the literature consulted for this paper will be completed with the outcome of a series of interviews with experts in the Flemish e-publishing sector.

Introduction

When the World Wide Web was introduced, doom scenarios predicting the end of newspapers and television made their appearance. Twenty years later, both are still here. Even though research has made clear that online news is used in a complementary way with newspapers, not substituting them (Althaus & Tewksbury, 2000), the Internet is still seen as one of the major reasons for the decrease in newspaper readers. Different technological aspects of the Internet have been studied as possibly attracting features for readers. A lot of research has been done on hypertextuality as changing the role of the newspaper to a news hub through which readers can access other information sites what makes reading a newspaper non linear (Cohen, 2002). Multimedia and interactivity have also been pinpointed as the main features attracting people to the online medium, whereas research on on-screen reading has proven it to be a strong threshold for consuming information on the computer and hence online (Beyers, 2002). This however is a rather technology-centred approach that does not take into account how people react on these new possibilities. Why would anyone watch the news online when image quality is still better on his or her television? The reasons for turning to the Internet for news have to be found in a much wider framework than just these technology-based aspects and the possibilities they offer. The interaction between these possibilities and the way people use them is very complex. In contrast to what the hype on web 2.0, new media and social software would like us to believe, the participatory, personally customized in-depth

news is far from being commonly used and expected, even if the technological means are available (Project for Excellence in Journalism, 2007). Often however, studies on these new possibilities of the Internet¹ analyse the ad hoc consequences of these technological possibilities whereas the long-term effects still need to prove whether these services are as revolutionary as they are often claimed to be. The social structure of (online) publishing is not changing as fast as the constantly improving technological capacities of the online medium (Kling & Callahan, 2003).

This social structure is the starting point of this paper that wants to investigate the existing concepts used in media studies to analyse the use of news and to refine and complete these concepts in order to develop an up-to-date conceptual framework for the study of online news. This conceptual framework must allow us to look at technological change from a less technology-oriented view but rather point to the changes in the relation between the newspaper and its readers. In order to come to this framework, the paper will analyse one aspect of this changed relationship i.e. the roles that are traditionally ascribed to newspapers and mass media in general. New media give people an increasing possibility to challenge these roles. By looking at the newspaper as an agenda-setter, a watchdog and a content provider, the impact of these new technologies will be framed in a wider context. These are certainly not the only roles that have been attributed to the press or the mass media in general through the development of mass media theory and the scope is not to give an in-dept overview of the theory on these roles as this has already been accomplished (McQuail, 2000), but rather to use these three roles as a way of conceptualizing the changes that might possibly occur in the relationship between newspapers and readers from a theoretical perspective. By doing so, the focus does not lie on the technology itself but on the way people are – or are not – using this technology and how this affects this social structure. First of all this will throw new light on the evolutions in the newspaper sector. Secondly, the blanks in the existing conceptual framework will become clear. As was mentioned above, the participatory possibilities offered by the new media seem to be of interest only to a minority of users. What remains unclear is whether, when and for which reasons the readers will use these available tools to alter or keep this relationship. In order to address these questions, the right conceptual framework is needed. The media-sector is being forced to view its relationship with the customer through a different mindset in order to anticipate and understand these changes. When investigating this relationship, researchers also need to take into account the factors that play a role in this new mindset.

Methodological approach

In order to argument these hypotheses a literature study was undertaken including academic sources as well as relevant (online) media sources. This literature is complemented by expert interviews. Recently, this qualitative research method has been gaining momentum as a fast access to a new or unknown field (Flick, 2002; Froschauer & Lueger, 2003). Experts often have high insight in aggregated and/or specific knowledge about ongoing processes, strategies or evolutions that are difficult to explore through other methods. According to Meuser and Nagel an expert is a person who has privileged access to information about groups of persons or decision processes or who is responsible for the development, implementation or control of solutions, strategies and/or policies (Meuser & Nagel, 2002). Expert knowledge has three dimensions (Dunn, 2004). The first is technical knowledge, very specific information on a certain field like details on operations, laws,... that influence the field. Process knowledge covers information on routines, specific interactions and processes. The expert holds this

¹ People like Tim Berners-Lee who was at the origin of the World Wide Web do not find web 2.0 a good term as the technology to make these new services possible was already available in the early days of the Internet.

information because he/she is directly involved in it. Subjective interpretations of relevance, rules, beliefs or ideas and ideologies are explanatory knowledge. The expert him/herself is then the focus of the interview.

For this paper, eight experts were interviewed. All of them have access to relevant information on the evolutions in the print sector because of their actual or previous employment or expertise in the sector. Some of them hold strategic positions within the media company they represent and therefore wished to remain anonymous. The author chose to keep all of them anonymous for the sake of the paper's uniformity. Because the experts' responses are relevant as an information source rather than as a respondents answer, this does not compromise the methodological process. The scope of the interviews was to gain explanatory and process knowledge on the Flemish situation as well as insight in what people actively involved in the sector experience as the most important bottlenecks towards the newsreader. This information nuances the theory and literature and refines the Flemish situation². Furthermore, in a second stage of the research, this information will be used for preparing interview topic lists for ethnographic research.

Because expert knowledge is not neutral, it is important to work both with experts and counter experts (Dunn, 2004). Experts being people who take part in the societal debate, it is needed to be careful not to give more weight to one specific side of the debate. The selected experts were therefore chosen in a way that their opinion on the whole represent different views within the debate on the definition of the problem (i.e. media – user relationship). Hereby, we seek to respond to the methodological critique one might have on the fact that the obtained knowledge is not neutral as the debate is characterised by power relations balancing the argumentation between conservative and innovative affinities. Other classic critiques on qualitative interviews as a method for data-collection include the fact that the interview setting influences the information obtained and that the effects of interaction between interviewer and interviewee are rather high. With expert interviews the risks are quite high that an asymmetric relation in favour of the interviewee resides because of the discrepancy in knowledge. Bogner and Menz call this the interviewer as layperson. The advantages are a high level of confidence by the interviewee, which generates a pressure to explain. On the other hand, the interviewer is not empowered to guide the interview. The interviews however took place after the author finished an in-depth literature study, which prepared him to face the interviewees rather as an expert outside the field (Bogner & Menz, 2005). Furthermore, the author being a media scientist, the possible discrepancy between both is reduced. This generates the advantage for the interviewer of being able to guide the interview. Moreover, a high level of discussion and information sharing is generated, where high explanation of motives and orientation is possible.

The relationship between newspapers and their readers

Previous research shows that various evolutions in the media market have an impact on how newspapers and their readers relate to each other. Market-driven journalism, as McManus pointed out, has been jeopardising the media's role as an independent fourth estate since the eighties (McManus, 1994). The rise of free newspapers in the late nineties alongside the boom of free online information sources have weakened the position of newspapers forcing them to jump on the trend of more compact news, infotainment and tabloidisation which erodes their role as watchdogs. People's ever more rushed lives and the growth of new and often complementary media (radio and television, computer programs, Internet, games, dvd,

² This paper is partially based on the first output of the FLEET-project (Flemish E-publishing Trends). The experts however were selected in such way they provided information on the Flemish context as well as on the more general evolutions in the media-sector.

mp3...) have reduced the time people are able to spend to newspapers and the attention they can pay to the articles.

The newspaper sector is being challenged by a series of new players. This was already the case when radio and television appeared, but the introduction of the Internet takes this a step further because of the digitalisation of content. As the Internet is a medium for text, audio and video, newspapers, television stations and radio become direct competitors. Because virtually everyone has access to the Internet, these traditional media also must compete with other content providers like companies and governments engaging in direct communication with their customers, news sites like nu.nl, Google News, msn.com and the blogosphere. As an expert put it, *“from the point of view of a content provider, the medium through which the content reaches the consumers is not important”*. The overall discussion in the newspaper sector tends towards the question how newspapers will remain viable in this context or in the words of the Economist, *“who killed the newspaper?”* (The Economist, 2006b). It is the scope of this paper to look beyond the market and the way new players, including the readers, are competing with the newspapers to scrutinize the more fundamental changes in the role of newspapers. These roles have traditionally been attended with a very normative theory building on how the press should operate if certain social values are to be observed and attained (McQuail, 2000). Even though this kind of theory is quiet important, it would take a paper on its own to deal with the normative ideas that come along with new media. This goes beyond the scope of this paper; even though some arguments made may be linked to certain values attributed to the media through their role.

The role of newspapers in a democratic society

From its early days, the newspaper was an actual or potential adversary of established (democratic) power, especially in its own self-perception. In this regard, the term “fourth estate” is used in literature, later on joined by “public watchdog”, a notion covering ideas of the press as representative of the public, critic of government, advocate of policy and policy-maker. The power of the press arose from its ability to give or withhold publicity and from its informative capacity (McQuail, 2000).

The ability to give or withhold publicity or information of any kind in general to reach the audience brings us to another role of the press i.e. the one of gatekeeper, selecting which facts will be reported. This role is closely linked to the agenda setting process or the possibility to decide on what news is covered and which issues are emphasized. As David H. Weaver, who has worked on studies of media agenda setting since 1972, argues this area of research is closely interconnected to framing and priming. Framing can be defined as the central organising idea for news content that supplies a context and suggests what the issue is through the use of selection, emphasis, exclusion and elaboration. When focussing on the consequences of agenda setting for public opinion the term priming is used to describe that media may suggest which issues to use in evaluating political actors (Weaver, 2007).

Finally, the press is an important news provider, a window on the world for its readers. More than other mass media, *“a responsible press should provide a full, truthful, comprehensive and intelligent account of the day’s events in a context which gives them meaning”* (McQuail, 2000). As the interviewed experts unanimously stated, newspapers must apart from bringing the news, offer the readers the background information and other informational means to fully understand and contextualise what happens. Still, one expert emphasized the fact that both on national as international level, news is a commodity. As another expert said: *“when the sector is looking at the new possibilities new media are offering, the main issue is not how to improve journalistic quality, but how to develop a well functioning and stable business model for those new services”*.

According to Denis McQuail, the new media provide the means for highly differentiated provision of political information on ideas, almost unlimited access in theory for all voices, and much feedback and negotiation between leaders and followers (McQuail, 2000). It is clear that all three roles are challenged by the new media, as will be explored in the next section.

Newspapers as an agenda setter

Agenda Setting and online news

Agenda setting and the gate-keeping process linked to it is one of the roles of newspapers and media in general that has been thoroughly investigated in communication science and is widely recognised (McQuail, 2000). In her study of news reading in 1988, Doris Graber concluded that story importance clues supplied by editors and the match between story topics and their own interests are the most important criteria used by newspaper readers when choosing the stories to read. These cues are article location, the size of headlines and visuals and story length and repetition. Articles that are more upfront or which have large and catchy headlines are more likely to be selected to read. These criteria are however, according to Graber, easily overruled by the interest readers show in a certain topic (Graber, 1988). These criteria however are medium-based. The way to access articles on a website is different. Websites offer people a more direct way to access stories of their interest by organising the news into topical categories or by offering easy search functions. As Althaus and Tewksbury put it in their research on the role of the medium on agenda setting, these features limit the potential that online readers will be exposed to the particular stories that a newspaper's editorial staff deems important (Althaus & Tewksbury, 2002). In that same study on how agenda setting might be influenced by the medium for delivering news content, the authors discovered that print readers partly modify their agenda's differently than online readers do. When comparing readers from the paper and online version of the Times, the former seemed to systematically come away with different perceptions of the most important problems facing the country. The authors conclude that by providing users with more content choices and control over exposure, new technologies may allow people to create personalised information environments that shut them off from larger flows of public information in society further fragmenting the news audiences. In other words, readers are able to set their own news agenda. The features of Internet however not only make it possible for readers to be more selective in their readings, but also to share the news that comes high on their personal agenda with their fellow readers and this on a large scale, creating a parallel peer-driven news agenda.

Agenda setting and online communities (of interest)

On digg.com people can post news items for the readers to rate. The best-rated articles come on top of digg.com's homepage. Readers can also select the best-rated stories amongst different categories of interest. The New York Times holds a list on his site of the most e-mailed and blogged articles. Citizen journalism sites like OhMyNews.com in Korea and news sites like nieuws.skynet.be in Belgium offer readers a most-read selection of the news. These are only but a few examples of the way readers are generating an own agenda of important topics. Not only are the intrinsic features of websites playing a role in the way the agenda set by editors is perceived by readers, communities of readers, either because they actively participate or because their online reading pattern is easily monitored, are able to define an own agenda of interests. An expert put it as follows: "*web 2.0 is an answer to the limits of looking for the right news. If 10.000 people with the same interests as me are making the same search every day, then it is more fruitful to organise this search and to share it with them*". The members of a news community become the agenda-setters for that community. As was mentioned before, news is everywhere. As another expert stressed, "*users do not feel like*

making a selection on their own out of an overload of information and expect that from their newspaper". By doing this, the newspapers and media in general are able to set an agenda of newsworthiness. Users online, through applications as digg.com, rss readers or Google News Alerts, are now able to set their own agenda. As a third expert countered, *"the user could have read this information package in the paper where he would be sure the information would have been double-checked. A newspaper is more than a news provider but also a label of quality"*. A fourth expert emphasized the importance of good filters in the increased news offer, believing that *"this role could be taken by traditional, generic news media who could "filter" what is seen as "the news" for a majority of users"*. What is clear is that there is a struggle for the appropriation of this role and that different players could take different parts of this role depending on the news wanted. These aspects are closely linked to the normative discussion on the newspaper knowing what is good for you to know versus the reader who can choose for himself but then risks to lose out on some relevant information.

In certain cases, user communities have been proved to be able to use the Internet (or more specifically the blogosphere) to put what they think is relevant on the news agenda. In June 2002 e.g. two 14-year-old schoolgirls were run over by an armored US military vehicle north of Seoul, South Korea. OhmyNews, an alternative online news startup, picked up the story and put it on the national news agenda by garnering millions of visits on their site. The emergence and success of alternative online news services challenged the dominance of major – mostly conservative – national newspapers in shaping the public opinion (Song, 2007). Such spontaneous reactions of the public are nothing new, but it is undeniable that Internet as a medium can play an important role in the fast, easy and cheap spreading of user-generated information as an alternative news source. In this case, however, it is also important to note that even this rather sophisticated and 100% user generated content site has a heavy editing process of the content that comes in from approved "contributors" from around the world (Project for Excellence in Journalism, 2007). This editing authority still has the role of gatekeeper. When talking about communities build round a newspapers' site, an expert coined the term gatewatching, *"letting the participative happen en just watch whether the delivered content is acceptable in terms of privacy and deontology"*.

An interesting concept in agenda setting theory in this perspective is the inter-media agenda-setting model, the process in which media coverage of a certain topic increases after major media players give prominent play to it (Song, 2007). This is an interesting concept because it plays an important role within the alternative news source community. We could speak of the inter-blog effect. As an expert stated, *"the impact of blogs is relative to the collective effect. A blogger's story only has an effect when it is picked up by other bloggers. In the blogosphere this effect is less structured, less predictable and more dependent on the quality and newsworthiness of the posted story than between newspapers."* Through initiatives like OhMyNews, Global Voices or digg.com users' views are aggregated and canalised in a way their impact can grow bigger. Of course, many of these sites or features might not be more than a 'news idol', an entertaining feature that will boost sensational and socially less relevant stories to the top of the homepages. On the other hand, these sites *"attract serious citizen reporting which tries to serve as society's democratic watchdog, a role that mainstream media have more and more abandoned"* (Hauben, 2007).

Newspapers as a watchdog

In media theory mass media and hence newspapers have been regarded as a kind of fourth estate watching over the integrity of the executive, legislative and juridical institutions. As an expert stated, *"when a newspaper publishes a study that is relevant, then the public opinion will acknowledge it and react. The involved political and corporate actors will react,*

allowing the newspaper to play its role in society". However, John McManus pointed out in his book *Market-Driven Journalism* already in 1994, that the press has evolved in its 150 years of existence, making news a *commodity* in the news *market* (McManus, 1994). According to McManus this business logic is crafting journalism to serve the market and not democracy. What is at stake is the survival of a public knowledgeable enough about current issues and events to govern itself (McManus, 1994). The press has been assisted in his watchdog role by nonprofits, nongovernmental organisation or civil society groups. The exponential growth of these organisations in the last decennia led Stuart E. Eizenstat to term them as "Fifth Estate". One of the reasons for this growth according to Eizenstat is to be found in the use of Internet, e-mail and mobile phones that allowed groups to build advocacy networks and to coordinate global campaigns to an extent that would have been impossible even as late as the 1970s (Eizenstat, 2004).

Without getting caught up into technology deterministic reasoning, it is not too harsh to say that the Internet has drastically facilitated the way for people to publish whatever information online. Moreover, it also makes it easier to communicate over large distances at high speed. What the Internet, websites and email did for the civil society, web 2.0 is doing for the people in general, turning the Internet in a viral platform for people to share and aggregate information and opinions. Already, this aggregation has led readers to call into account the media. Recent examples are the RATHERGATE scandal in the United States where Dan Rather reported in his highly respected news show *60 minutes* on CBS September 2004 about a number of documents accusing president George W. Bush of having misused his family ties to skip military orders. Only three hours after the show was aired Scott Johnson launched in the blogosphere a post challenging the authenticity of the documents based on anachronisms in the typography. Two weeks of speculations later, CBS admitted that the documents were not authenticated by their experts as they had reported, eventually leading to the firing of producers Mary Mapes and several senior news executives (Van Brackel, 2004). "The old media model was: there is one source of truth. The new media model is: there are multiple sources of truth, and we will sort it out," says Joe Kraus, the founder of JotSpot, which makes software for wikis (The Economist, 2006a). An important principle here is collective intelligence: even if the media have their own experts double-checking their sources, it is likely that between the thousands of media users, there will be a number of people with the same or higher level of expertise. Scott Johnson e.g. is a lawyer at a prestigious law firm in Minneapolis and vice president of a bank. Such people have a certain authority that can compete with that of a news agency. An expert stressed the fact that "*journalists could let evolve an article on the blogs, letting people participate, correct and add information, giving it more social relevance so it can be picked up by politicians*". In this perspective, newspaper's watchdog role can be reinforced with the help of the public.

Newspapers as information/news providers

As we noted in the introduction, the newspapers have to deal with a heavier competition from other players, especially online, offering the latest news. This, in combination with the explosion of offline free newspapers like Metro, has turned news in a free commodity accessible almost everywhere in a constantly updated form. Quite a strange thought is that, by following this trend of free news online, newspapers are cannibalizing their own paper editions. The core product of a newspaper, as the name says, is where competition is the strongest and where they seem to be losing ground. What became clear from the expert interviews, is the fact that newspapers bring more than just news and should concentrate on offering background and context information of a high quality. "*What I am doing*", an expert said, "*is not making a newspaper, but selecting, collecting, analysing, controlling and*

commenting news, whether this is on paper, on a site, or in the future on a watch or digital television.” As another expert put it, however, “*if you receive an entire walking diner for free and you then have to pay for a gastronomic diner, you will not be hungry anymore.*” There lays the problem facing the newspapers. The content they can offer as the best, qualitative news, background, analysis and context, is not what a large majority of consumers is seeking. They want the news and they will find it everywhere and mostly for free.

When newspapers report on their own future, blogging and citizen journalism are often seen as negative evolutions, keeping readers’ (scarce) attention away from the professional journalism they stand for. Even though newspapers seem to embrace the blogosphere by creating own blogs for their readers and journalists, they do so to please or win back their audience, not because they embrace the possibilities of it. The articles found on newspapers’ websites are often nothing more than ‘shovelware’: an unmodified copy of those in the printed paper (Boczkowski, 2002). Many journalism practices approach these new possibilities in a conservative and rigid way and tend to avoid as long as possible the renegotiation of what is conventional and normal in journalism. As the newspaper affiliated experts stated, blogs are merely online diaries that are of interest only to the blogger’s entourage and bloggers do not have the means and professional rigour to thoroughly investigate a certain topic. However, in these spaces, there is room for writers to have their stories read online, including journalists who want to nominate creative, investigative reporting for public consumption outside the constrains of media firms (Cohen, 2002).

Certain kinds of information lend themselves more to be handled by the public, as different experts pointed out. Bloggers can become a source for readers to consult opinions about certain news facts and the way their peers think of it e.g. the blogs of politicians or public persons, but also of fellow bloggers and journalists, that by doing so may counter “the commercial and political pressures on institutional news media” (Godwin, 1999). Furthermore, as mentioned above, according to the principle of collective intelligence, journalist should welcome readers who represent an authority on certain issues to complement and check their articles, because they will also challenge the ability of professional journalist to give background and context on a certain topic they, as experts, know better. As an expert stated: “*press agencies more and more take the role of daily news providers offering their news feeds through a whole range of news websites, but do not offer this service for the more thematic and regional or local news*”. Hyper-local news is a third kind of information user might be more suited for to bring than newspapers. A hyperlocal news site (also known as local-local or microsite) is devoted to the stories and minutiae of a particular neighbourhood, ZIP code or interest group within a certain geographic area. Such sites have been springing up on the Internet for some time now, initially as independent start-ups, created and maintained as labours of love by founders who work on a shoestring budget (Shaw, 2007). Not that they were not able to do this before, but the organisation of a local paper is a costly and highly intensive activity in terms of infrastructure. Blogs, fora and websites make this a lot easier. Furthermore, the video and photo applications in cell phones become more widespread, which facilitates local citizen journalism even more. Several of the interviewed experts stressed the fact that journalism is becoming a conversation rather than a monologue. *An article is not the finishing point of a journalist’s work. It is only the beginning*, as one expert stated. The readers becoming providers or producers of content is what Boczkowski coined “distributed construction”, challenging newspapers’ traditional role of news-producer and gate-keeper (Boczkowski, 2004).

Conceptualising new user roles

As became clear by analysing the changing role of the newspaper readers are taking over certain parts of these roles. Central to newsreaders' (-viewers' and -listeners') changing role is that they start doing more with news than only read it. They start using it in different ways: they comment it, share it, rate it, tag it, and even produce it. Therefore, we prefer to talk about news users. The concept of a news user is also more suited in a world where the digitalisation has not yet finished to converge data (meaning every form of information). Especially when we look at the use of the Internet, which is becoming a platform suited for text as well as audio and video, the concept of a newsreader is not adequate anymore for research. News website often already offer videos and podcasts next to the written news. This convergence of technology, at this point represented best by the connected computer, leads to a convergence in media users what in turn changes the meaning of a newsreader, listener and viewer. In the same line of thoughts, Mark Deuze, building on Zygmunt Bauman's concept of liquid modern society (Bauman, 2005), states that contemporary changes in the economical, political, societal and technological sphere put the user in a virtual space where he is continuously surrounded by different but connected media. This raises the convergence between the different spheres of action of daily life, blurring the difference between work and private but also between consumption and production, between passive and active consumption of media. In other words technological convergence is leading to cultural convergence, which has it's own logic (Deuze, 2006).

Web 2.0 has made it easier for users to share their thoughts and ideas through text, audio and video over the net. This in addition with the technical means of content production becoming ever more accessible for a larger public through democratic prices and the appreciation of the public, has led to a boom of user-generated content, one of the sector's big buzzwords. The consumer is in other words moving up in the value chain becoming a producer as well, what futurologist Alvin Toffler predicted in his book *The Third Wave* and coined with the term *prosumer* (producer-consumer) (Toffler, 1980). In the case of the newspaper, this phenomenon is translated in the citizen journalist or the blogger. Still, further reflection on this concept is needed.

The prosumer

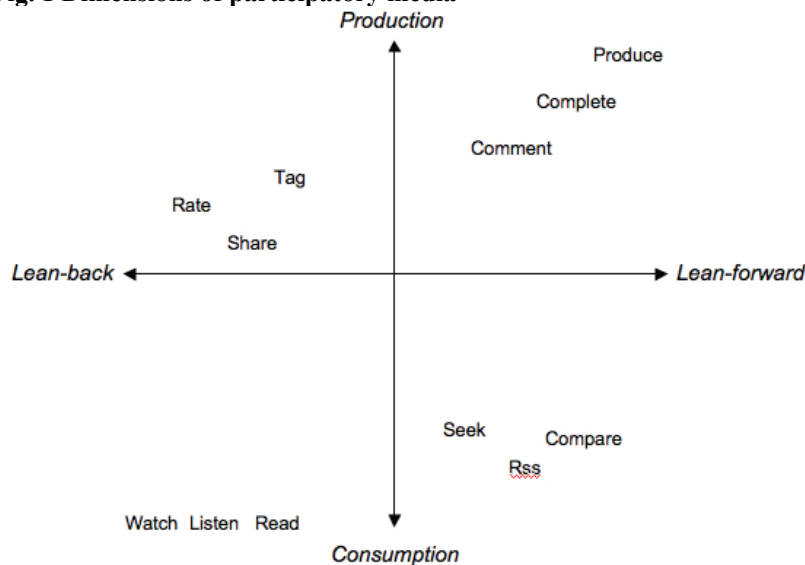
The concept of prosumer was introduced by Alvin Toffler in 1980. He stated that by the new millennium consumers would get highly involved with the design and production of goods so they could be delivered according to everyone's personal needs and specifications. He formulated arguments for a new marketplace where products are not dumped by industry but where consumers participate in the creative process (Toffler, 1980). This term is not to be confused with the concept used in marketing where it stands for *professional consumer* or *professional amateur*, being someone with an interest in a certain hobby that big that he wants to be one of the first having the latest products in that branch. In a new media context where user generated content is believed to be important both for its product value as for its exchange value, the consumer contributes to the news making process in different ways (see above). In this framework, the concept of prosumer however needs to be refined. First, a prosumer is a consumer. This implies that he is buying a product or service for a certain prize. However, one of the big questions concerning user-generated content is how to make it profitable. The essence of user-generated content is not commercial in contrast to Toffler's vision where the prosumer defines the specificities of the product he eventually wants to buy. When looking at newspaper blogs or free news sites the consumption aspect of user-generated content is obvious. When looking at online citizen journalism communities, their audience consumes the information but not (yet) in an economic-value generating way. The concept of

the prosumer implicitly refers to modern market logic. When looking at user-generated content in general we could talk about the *produser* (producer – user) instead: users who use content in such way it generates additional content. In this regard, speaking about news users makes it easier to conceptualise the newsreader’s changing role: he does not merely consume news, but also shares it, rates it, searches it and produces it. He is using the news in various ways. The production of news becomes a part of the consumption of news. The boundaries between both blurry or disappear. News user therefore seems a good concept to analyse this group because it incorporates the two dimensions: he uses the news in a variety of ways consuming and producing it at the same time.

Dimensions of participation

The news user thus uses news in many different ways sometimes producing as well. Traditionally, watching television is termed as a lean-back activity, whereas sitting in front of a computer is rather lean-forward. (Jansz, 2005; Körber & Maknavicius, 2003). When looking at online news, this lean-back/lean-forward continuum seems to offer an interesting instrument to look at how online news possibilities are used.

Fig. 1 Dimensions of participatory media



At one end of the continuum we will find the people who actively search for news, look at different sites, use rss readers to receive information, write news stories, place comments and rate items, on the other end we will find the people reading online versions of their trusted newspapers, trusting the news selection of a certain provider, preferring television or printed news to online news. However, actively look for information is a lean-forward way of using news, even if it does not engender any kind of content production. Therefore, in order to fully understand new news practices, this continuum should be given an extra dimension, namely the one discussed above concerning the prosumer. In the online world, consuming is not by definition lean-back, and also prosuming can be done in different degrees from less to more lean forward, as is shown in Fig 1.

When analysing the Internet as a more lean-forward medium, we must not be blinded by the hype. As the State of the Media 2007 study shows, What we found in the sites studied is that the participatory nature of the Web is more theoretical than a virtue in full bloom (Project for Excellence in Journalism, 2007). But, as an expert stated, “*media must offer the possibility for interactivity without it getting pervasive or obtrusive for the passive user*”. Consumers must have the right to be passive. By using the above continuum to analyse news practices, we do

not need to see participation as something people do or do not, but can do in different degrees, allowing us to get a far more specialized view on how people look at these possibilities. Production in this context must be seen as contribution. When rating news e.g., people are producing a hierarchy that can influence the news agenda.

Communities of interest in news

When studying online news, the aspect of community plays a greater role than offline. The sites that have been mentioned through this paper are only but a few examples of news sites that thrive on a community of users that actively participate in the production of content or passively use it as a news source. It is likely that these virtual communities are rather impersonal, not based on sharing the most intimate information but rather sharing thoughts and opinions on the relevance of certain news items. According to Katie J. Ward a characteristic of virtual communities is the fact that the audience is ephemeral, not making a long-term commitment to the virtual community. Rather they will be more instrumental in their approach to the community, staying as long as the community is providing a solution or fulfilling a need in their life (Ward, 1999). This is linked to Bauman's *Liquid Life*, as the ties in a virtual community are looser or "more liquid". In the context of news, these needs are informational, but not only to get information, but also to retrieve it, share it, rate it, comment it, produce it... The more interesting information the community has to offer, the more members it will attract (Edlund, 2000). The content that will differentiate one community from another is the content generated by that community. This exchange of information within these groups is the essential contributor to the social capital of such networks. A vital part of social capital is trust, what brings us again to the importance of this concept.

A specific feature of computer-mediated communication is the lack of physical, social and other nonverbal information exchanged between group members. This anonymity has both beneficial as well as damaging consequences for the trust within a virtual community (Blanchard & Horan, 2000). On the one hand individuals can increase their first impressions or accentuate their characteristics with which they identify mostly with the group. The more you identify with a group, the more likely you are to trust the group. On the other hand, this anonymity and the lack of social and physical cues may cause deception because of the difficulty to establish the authenticity of information about the other members. Not all these elements apply to a news community, as the scope is not to get personal information from one another or to share deeply personal thoughts, but to share news and comments on it. Still, this anonymity can become harmful, as anyone can post news stories that can be false, especially on sites where no editing is provided. Furthermore, anyone can pretend to be an expert and also here it takes a critical user with enough knowledge to check the background of certain sources.

Refining existing concepts

Participation

Acknowledging the existence of collaborative intelligence, the idea of journalism becoming a conversation rather than a sermon is beginning to find its way amongst journalists and news companies. Major international news sites like the New York Times and in Flanders De Standaard Online amongst many others already offer their readers the possibility to add comments and to participate, and hence becoming a news source of information for journalists. This should evolve even more, according to an expert who said "*the newspaper should become more interactive, referring to the newspaper's site, giving readers the opportunity to discuss online certain topics launched in the paper and afterwards summarize*

the outcome of the online discussion in the paper. This makes the two media complementary instead of supplementary". But another expert added, *"The number of people actively posting information on Wikipedia is small. Most of Wikipedia's users are merely consulting the site"*. This is referring to the pyramid Bradley Horowitz, Vice-President of Product Strategy at Yahoo!, posted on his blog in February 2006. The top of the pyramid is populated with 1 creator, followed by 10 synthesizers; the body is made of 100 consumers. He states that 1% of the population is now initiating the production of content, 10% might actively participate by responding to that production and 100%, which he calls lurkers, will just benefit from the activities of the above group. He notes that it is not necessary to convert 100% of the audience into "active" participants to have a thriving product that benefits tens of millions of users. The barriers users have to cross to become creators work as a filter that can eliminate noise from signal (Horowitz, 2006). It is thus not for every user to become a producer.

As became clear in the first part of the paper, the increasing possibilities users have to contribute and participate in the production of news is altering the relationship between newspapers and their readers. The dimensions of participatory media use as shown in figure 1 can help to understand how the user is taking up certain roles or parts of it from the newspapers or mass media in general, as is schematically shown in the following table.

Consumer – Media interaction

<i>Action</i>	<i>Role</i>	<i>Agenda Setting</i>	<i>Watchdog</i>	<i>Content production</i>
Look for (alternative) information (rss, blogs, ...)		X		
Tag, rate and/or share news		X		X (metadata)
Correct, complete and comment news		X	X	X
Produce news (citizen journalism)			X	X

Trust

The trusted news brand

A recent international study by the BBC, Reuters and the Media Centre (Globescan, 2006) shows that people's trust in the media is relatively high, giving more credit to the media than to their governments. 61% of the respondents trusted the media against 52% trusting their government. Television (82%) and national and regional newspapers (75%) are the most reliable sources according to the study. Blogs also seem to be consulted as a news source, though only 25% of respondent trust the information, South Korea (home country of OhMyNews) being the exception. Still, the outcome of the study suggests that it becomes more difficult for those information providers to hold people's trust. More than a quarter of the respondents said they stopped consulting a certain news source because they lost faith in the source's content. Even though television and newspaper still are the dominant news sources world wide, in terms of consulting news sources and trusting them, users are developing a more nuanced approach towards the media. 77% of the respondents prefer to check different news sources, something that is off course easier online.

Still, as an expert pointed out, newspapers have strong brands or a certain history, which makes people associate news with them; *"Based on what people find important they choose the medium to use. This is the bond of trust a news provider develops with is audience. The*

more it can procure information on the concerns of its audience, the more successful it is". Another expert called this the seal of approval of trustworthiness. Hans Beyers, who did a lot of research on online news in Flanders in the past years, concluded that Flemish users often read the same newspaper online than in print (Beyers, 2002). When they go online, readers remain loyal to their printed paper, or better, they remain loyal to a certain brand they believe is trustworthy. New players online will have to compete with the relationship of trust traditional media brands have build with their user throughout the years.

Communities of trust

Already in 1994 McManus acknowledges the impact communities of taste, peer groups and other external forces have on consumers' choice. He pointed out that when the journalistic quality is difficult to discern, consumers are compelled to rely on "brand names" or develop alternative information sources for evaluating news, such as direct civic involvement. In a connected world however this civic involvement is facilitated in that way that people have the same means than news organisations to reach high number of readers, namely the Internet. In other words, alternative news sources have always existed, be it in the form of colleagues commenting news during the coffee break or the alternative newspapers like le Canard Enchaîné in France, but the Internet, and especially web 2.0, with its increased user-friendliness, make it possible that these alternative voices reach a larger public with less means necessary. Because of the Internet's facilitating features in terms of distribution and reach, people might get more motivated to participate to these news sources, which in turn can makes these bloom and hence get more "news appeal" for news users.

Some of these alternative news sites have already proven to be able to build a vast user community around their site like OhMyNews, nu.nl or Agoravox.com. The reason why this is quiet an achievement is that alternative discourses do not appear to carry the same authority as the traditional news organisations' online news (Cohen, 2002). An idea reached out by an expert was that *"newspapers should become community builders, offering more than news to please the community and listening to the community's demands. Gaining the trust of this community will then be essential. The community build around a newspaper can benefit the paper as well, not only in terms of bonding users to your brand, but also because they might contribute to the value of the newspaper by sharing their knowledge or signalling new trends"*. According to another expert *"such a community is generated around points of interest. When the community serves the common good of its members, she will prevail"*. An example of such a trend signalisation is the web 2.0, a term that Tim O'Reilly coined in 2004, that was picked up by the mainstream media after a lot of buzz was created around it in the blogosphere. Trust is likely to become of increasing importance in a world where information is everywhere. As an expert stated, *"it will be important that users can make the difference between user-generated news and professional news. Citizen journals need to clearly state that the articles are based on personal experience and not on investigation of professional journalists. This will be important fort the level of trust users will have in the online medium"*.

A new conceptual framework

When studying the way readers relate to the newspaper, it becomes clear that the possibilities offered by the Internet make it easier for readers to take over part of roles traditionally held by newspapers. As shown in the table above, the way in which readers are using the news defines the role they take. Due to the technological convergence, readers become viewers become listeners in the online news environment. Users, consuming and producing news, therefore seems a better term then newsreaders when looking at online news. This term allows the levelling of news use, as participation is something that can be done in different degrees. The

producing user is not the terminus in the evolution of the consumer. Not everyone wants to become a creator. The lean-back/lean-forward and producer/consumer dimensions of this use offer a valuable tool to map and differentiate the activities of the online news user. It also makes it possible to identify possible barriers to participation. Another important aspect when analysing participation and especially the production of newsworthy information is the kind of content. Opinion, expertise and local news seem to be more adequate for non-professional users to produce than in-depth news coverage. The end of a newspaper as a content provider – not as a medium – is therefore rather exaggerated.

As the news user is not by definition a creator, he is not by definition member of a news community either. However, as is the case for virtual communities, he will freely join a community if it fills his needs. A news community is typically a community where users will turn to when they need certain information. The impact a user will have on the role of newspapers however will be defined in terms of the number of users contributing (cfr. inter-media agenda setting). Important in that case will be the level of trust people have in the community members. Not only news brands but also these communities or the news brands that house them will have to gain user's trust. Authority, collective intelligence and the ability of users to differentiate trustworthy from false information will play an important role in this regard as will trust in the evolution of the relationship between newspapers and users.

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Social Innovation Among ICT Users: Technology as Catalyst in Promoting Social Change

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Abstract

This paper addresses mechanisms of the innovation process in the social field, particular the transition from user innovation in the technological sphere to innovation in the sociocultural sphere. In research conducted at Montreal's Laboratoire de communication médiatisée par ordinateur (LabCMO: <http://cmo.uqam.ca>) over the last two years, our research team observed the activity of two groups of innovative users acting in the technological sphere, the first within the free software domain and the second involving urban wireless networking. Our observations suggest that these "techno-activist" groups have developed an ideological platform oriented towards social change and inspired largely by their technology-directed activity.

User-centred innovation research by scholars such as Eric von Hippel (U.S.) and Christophe Aguiton and Dominique Cardon (France) has demonstrated how, by freely sharing ideas and artefacts, users who innovate develop dense communications links to bind themselves within larger communities of innovators. Research in that tradition has thus far been concerned chiefly with technological innovation. In examining the mechanics of innovative processes within the social field, this paper turns to how user innovation in the technological sphere have transitioned to innovations that resonate in the sociocultural sphere. In a research project undertaken at LabCMO in Montreal over the last two years, we observed and described the activities of two groups of users innovating in the technological sphere. The first group operates in the free software domain; the second group's activities involve urban wireless networking. Paired with their joint technological innovation, however, members of these groups ("techno-activists") have developing joint ideological platforms oriented toward social change.

That ideological platform is built around specific activities, values and beliefs: enrolment of their activities in international networks and exchanges, not an exclusively local community of user-innovators; a heterarchic structure of work organization, not an exclusively hierarchical one; an ambivalent economic relationship with existing capitalistic forms; and a set of social representations of the technological world used as a foundation upon which to construct a politically progressive platform—one riven, that is, with political and economic contradictions. These activists position their technological practices as an opportunity to renew social forms of organization, of collaboration and of communication. In criticizing the prescriptive and normative composition of technical devices marketed by large-scale software and by telecommunications providers, they foreground deliberation as an essential innovation mechanism within the community of users. The sociological questions we want to address involve the extent to which these new forms of organizing collaboration are permeable vis-à-vis other groups and communities with which these techno-activists interact. In what ways can techno-activist practices influence other groups already engaged in social and political

action? Do such practices play a significant role in transforming the public sphere more generally?

To address these questions, I begin with a brief presentation of a theoretical model for what I call the “social appropriation” of digital technology. I then present the socio-economic factors which underpin these digital technologies’ emergence in the context of informational capitalism. Third, I will describe our study of two specific techno-activist groups’ practices at LabCMO (Montreal, Canada) over the last two years. In conclusion, I show that these grass-roots digital technology movements help build a bottom-up alternative to the dominant top-down view expressed in the promotion of a so-called “global information society”.

1. The “Social Appropriation” of Technology as an Ideal-Type

The concept of “appropriating” a technology fits well with what German sociology Max Weber has termed an “ideal type”, which is

formed by the one-sided accentuation of one or more points of view and by the synthesis of a great many diffuse, discrete, more or less present and occasionally absent concrete individual phenomena, which are arranged according to those one-sidedly emphasized viewpoints into a unified analytical construct. [Cited on *Wikipedia*.]

To establish that a genuine appropriation of technology is taking place, one prerequisite—access to the technical device—and five conditions must be satisfied:

- a) technical and cognitive mastery of the artefact;
- b) meaningful integration of the device’s use into the user’s everyday practices. It is here that I introduce the distinction between mere use of a technical device, on one hand, and a user’s enrolment of it in social practice, on the other hand. Using word processing software as a technical device, for instance, is distinct from the user practice of writing in which it participates;
- c) innovation: using the device introduces new creative avenues into the individual’s social practices, rather than merely participating in them;
- d) community mediation: learning processes and support are shared within a mobilised collective or community of practice with which the user identifies;
- e) political representation: social appropriation presupposes that user collectives are adequately *represented*, a matter which regards both public policy and innovation markets.

Satisfying all of these conditions signifies successful appropriation. Yet, without fulfilling the prerequisite requirement, which is access to the technical device, appropriation will be impossible. Cognizance of this prerequisite alongside the conditions allows us to distinguish appropriation from mere access—a distinction which comparative national statistics on technology penetration often confuse. Access to a device does not necessarily imply mastering its use.

2. The Emergence of Informational Capitalism as Context for Techno-Activist Social Innovation

The emergence of informational capitalism. Social experiments in “informational cooperation”, whose analysis is central to our research, echo the position some groups of social actors have taken in the ongoing transformation of highly digitized societies. Analysts describe certain, emergent forms of the mode of production in contemporary societies as belonging to a new “informational capitalism” (Aigrain 2005), by which they mean that our current societies tend to yield a particular type of industry—those industries which capitalize on the ownership of the code (Lessig 1999; Weber 2004; Ghosh 2005), such as the software, pharmaceutical, or media industries. Activists engaged in cooperative projects in the information and communication fields question the legitimacy of this new dominance (Blondeau, Latrive 2000; Moody 2001). As opposed to a proprietary definition of information, these actors maintain that information is a public good. It is this commitment to values such as gift economies, accessibility, open exchange and communication—all first linked to information by software pioneers—that anchors the commitment of so-called “code activists” or “techno-activists”.

Our research aims to situate the innovative practices of these “techno-activist militants” within the broader context of emergent social protest movements that denounce the code-owning industries in the context of informational capitalism (Castells 2002; Granjon 2001). We seek to identify the extent to which code activists are part of a process of civic negotiation of our societies’ digitization (Boltanski, Chiapello, 1999). Some contemporary thinkers have located a novel perspective on democratisation in civic forms of technological appropriation (Loader 1998; Feenberg 2004). Our study is an opportunity to grasp the values put into play by these processes of innovation, from their initiation, negotiation, and coagulation to their wider public deployment.

Innovation by use. Most information and communication technologies (ICT) users position technological objects as “black boxes”, paying scant attention to the objects’ inner workings. Code activists, on the other hand, act as a sort of technical handyman, they do not hesitate to look inside codes or devices to take an active role in how informational objects work, particularly through computer programming and the design and dissemination of new technological devices. Technologies’ network organization favours cooperation between users and designers, facilitating not only acts of appropriation, diversion, and tinkering (Certeau 1980; Perriault 1989), but also those of co-construction (Oudshoorn, Pinch 2003; Neff, Stark 2003) rising even to the level of tangible technological innovations linked tightly to innovative usage. Set in motion from below, these innovations break with prescribed uses, emerging to respond to users’ *ad hoc* needs. Considered decisive by creative process analysts, these innovations are known as “ascendant” because they proceed upward and onward from the exploration of users seeking to improve what they can do with already-existing technologies (Von Hippel 2001, 2005; Cardon, 2005). Born of the ordinary practices of resourceful users, these innovations diffuse through networks of user exchange.

Technical innovation and social change. Analysts of innovation posit a complex linkage with between it and social change. Analysing sociotechnical controversies (Callon 1981) has demonstrated both the non-linear, socially constructed character of innovation, and some of the mechanisms by which the ideological and political challenges these innovative processes mobilise are staged in public (Latour 2001). Usage studies (Proulx 2005) have, for their part, demonstrated the non-linear manner in which technological objects are distributed (Rogers

1995), underlining users' ability divert (Certeau 1980), reinterpretation (Bijker et Law 1992), and socially appropriate (Proulx 1994 ; 2002) the technology. New principles for collective action emerge from these hybridizations of social and technical spaces. Only those uses of technology that lead to tangible change in social practice can be characterized, according to Tuomi (2002), as innovation.

3. A Research Project Studying Techno-Activist Practice as a Source of Innovation

3.1 Main Objectives of the Project

Anchored in a participative approach associating our team directly with the groups connected to this research, our project seeks to provide detailed description and analysis of groups of persons experimenting with what we have called "informational cooperation" within Canada. The research focuses on the practices and values of "code activists" creating non-proprietary devices which, as alternatives to the code industries, produce social innovation. The project's main theme is to evaluate the transferability of the values associated with these practices of technical innovation into other spheres of activity (Himanen 2001; Lessig 2004; Brand 2005). To what extent can these technologically innovative practices provoke socially innovative practices in the political sphere of citizen and democratic action?

Our analysis centres on two groups located in Montreal (Canada). They operate at the intersection of the Quebec community movements and free software movement. Their activities are highly technological but, at the same time, oriented toward social change. Members of the two groups agreed to join our team as part of a participative approach involving them as full participants in the research process. The groups are:

Île sans fil (ISF). ISF, a Montreal volunteer organization, was founded in 2003 by three university students, and now forms a municipal network of over 100 Internet access points provided free of charge in public spaces like bars, restaurants, and cafés. ISF is a non-profit organization whose goals are to promote free, public access to WiFi-based Internet access, to create and maintain a network of WiFi access points in public locations, and to use WiFi as a tool to promote art and cultural content and social applications. Thirty active volunteers contribute to hardware and software development, install equipment in public places, and manage marketing, communications, and public relations. In the past two years the working model of ISF has been lauded, and its hotspot management software held up as an innovation worthy of reproduction (Powell 2006).

The group considers wireless technology to be a means of creating social networks. For the past 18 months, ISF has focused its efforts on two infrastructure projects. The first of these is the deployment of hotspots in public spaces, such as parks and cafés. The second is the creation of open access, roof-to-roof high-speed Internet infrastructure. The group was awarded the Montreal Social Innovation prize in 2005 and currently has close to 10,000 users.

Koumbit is a Montreal-based volunteer organization founded in 2002 whose mission is to promote the appropriation of free and open software by social groups in Quebec, in Canada, and abroad. This group works on the development of a collective software platform and provides support for users of free and open software. The name "Koumbit" is a derivation of the Haitian Creole word *Konbit*, which can be translated as an association of people working towards the realization of a common goal. On their Web site, the group describes its founding principles as follows:

Collectively managed: we believe in a greater autonomy for people and collectives. We believe that it is essential for groups and individuals to manage by themselves their direction, life and authority. *Educational space:* we believe that our organisation must not be a simple service company but must also integrate continuing education of workers and members to new technologies, but also along the principles of participative organisation like ParEcon and other horizontal organisational techniques. *Transparency:* we believe that organisations should be transparent [*sic*] towards their members but also towards society at large. No organisation evolves in a void and all our actions have consequences. Therefore, it is essential that the public can follow on the actions and decisions of the different organisations that make society. We believe that the flow of information coming out of organisations must not be blocked, but be broadcasted so that citizens can take enlightened decisions on the issues that affect them. *Copyleft (free software):* we believe in developing free and open source software. Free software is a matter of freedom (as in speech): everyone should be free to use software for any socially useful purposes. Software is not a tangible material object, like a chair, sandwich or oil, so it can be copied and changed easily. Those possibilities render software useful as such; we believe that software users must be able to appropriate those possibilities.

Self-sufficiency: we believe that our organisation must be self-sufficient and not depend exclusively on one big customer or state to finance itself. We are always looking for ways to diversify our sources of income and believe in partnership to develop durable and functional links with other organisations. Similarly, we offer technological solutions that empower people with their own tools within their organisations. *Solidarity:* we believe that our organisation must support citizen initiative and the left behind of our society. We also believe that an organisation must build itself in support and respect of each other, their integrity and their dignity. We also believe that some sacrifices must be made so that the organisation doesn't harm mankind and nature as a whole. "Above all, do no harm". *Equity and equality:* we believe that everyone must have the same chances not only at the start, but also during the race. We are trying to eliminate inequities between individuals and compensate those which are impossible to eliminate. *Participatory Economics:* we believe in balanced job complexes, variable modes of decision, in participation of workers in the definition of their workplace, in participation of parties affected by the services of the organisation in its orientation. In short, we are strongly inspired by the Participatory Economics model enounced [*sic*] by Michael Albert. (see Goldenberg 2006)

Some studies on governance and cooperation models in activist groups exist (Granjon 2001; Auray 2005; Conein, Delsalle 2005; Aiguiton, Cardon 2006). The study of informational cooperatives, however, must take into account how these localised practices are articulated with the militant ambitions expressed in international networks of activists and global social forums. Since the local groups are simultaneously bound to international networks, we are given to analyse their local activities in light of broader debates concerning the so-called information society which have unfolded in the global arena (Fontan 1998). Our ethnographic descriptions, produced in collaboration with the actors in a participatory approach, have the following four objectives: 1) to explain the context in which these groups situate their activities and describe how they seek to innovate socially and technologically; 2) to analyse how the groups define the modalities of democratization through informational cooperation, and the transferability of their innovations into other spheres of activity; 3) to identify the controversies that emerge in thus-constituted local public spaces and their interaction with the

broader questions that inform contemporary debate; and 4) to trace the prospects for generalizing these practices and innovations to contribute to the common good.

3.2 Methodology

Participative ethnography. Putting a participative approach in place (Dallaire 2002; Barnsley, Elis 1992), our ethnographic descriptions were compiled by two observers. Each observer first clearly identified herself to the group as an observer and a university student. After some time, and on a voluntary basis, each observer became a full member of the organization. This obviously gives rise to several questions about the relationship between the observer and the observed. We are aware the knowledge that we generate about each group teach the group about itself and thus stimulates self-analysis within groups regarding clarification of their missions and organizational models. Our observations brought key points to the fore about group identity, sources of controversy, and mission. Each observer simultaneously played both the role of conveying information between the research team and the observed group, and of actor provoking the group's self-reflection and self-analysis.

This *participative ethnography* tends towards a progressive appropriation by the observed group of the research goal's (re)definition in line with its specific interests. We reject the dominant sociological position that requires a "suspended" position to study the group being observed. The precautionary principle characteristic of our approach lies in seeking not to impose the researcher's vocabulary on actors in the field. We contemplate a reciprocal enrichment of worldviews and a reciprocal contribution to knowledge between the research team and observed group. Our methodological approach's purpose is to understand the meaning that the actors themselves ascribe to their identity, their project, and their activities in order to support a reflexive approach within each of the target groups. This approach thus presupposes an epistemological (re)articulation between the production of scientific knowledge and its potential use by users in the field. How can our results be incorporated back into the activities and reflexivity of the target group? How can socio-political commitment be articulated in conjunction with scientific rigour?

3.3 Hints and Results

Towards a politicization of technology. Code activists offer users the possibility of approaching technological culture in a different way. They suggest a new way to represent technology. They reconceptualize technology, not simply as a set of "tools" to be used to further a project of personal or social emancipation, but rather as a "culture" or set of devices and apparatuses that are not neutral tools but, on the contrary, are value-laden and organized into technical configurations that encode power relations, promoting one type of activity to the detriment of other possible types. Technological devices are not neutral. The innovation process operated by these activists is part of a transformation of the relationship between users and the technological world (Jouët 1987; Bencheikh 1986). Yet, once technology is conceived of as a culture (Simondon 1958), representing the technological world as this type of transformation becomes profoundly political, and therefore disposed to provoke significant change within the broader register of social values (Lessig 2001).

Can these new representations of technological culture help carve out new spaces of citizenship inside the public sphere (Feenberg 2004)? Informational cooperation projects import a taste for change into a technological world whose incumbent values the large, proprietary code industries which police its borders would prefer we accept passively. More radically, Cardon and Granjon (2003) note that a politicized segment of the techno-activist population presents itself as a militant counter-culture in which collective software

production, technical process and anti-institutional digital insurrection coalesce. Code activists in this sense produce new spaces for collective action and, through their actions, put forward a model for extended participation in which developers and users can participate jointly in the collective production of public technological and informational goods. We hypothesize that this construction of new public space around technologies could lead to citizen empowerment. As our earlier research regarding the free culture controversy revealed, activist practice in the technological sphere is a source of social innovation, particularly from the standpoint of collaborative practices established in how work is organized (Proulx, Couture 2006).

Innovations in informational cooperation. In experimenting with new forms of collaboration around the organization of their production work, code militants act politically. Analysis of these collective practices suggests that such models of action and involvement are neither unified nor stabilized. As in some scientific communities, multiple controversies over how technology uses are articulated into work organization appear to stimulate group activity among code activists. For some of them, the opening up of technological apparatuses is a technological victory; for others it is a measure of democracy. As the search for consensus within activist groups reveals, informational cooperation's pragmatic objectives invites a novel deliberative process around themes such as the decentralization of technological action, procedural governance, and collective management of training (Proulx Rueff Lecomte 2007).

4. Conclusion: What Sort of Digital World are we Constructing ?

Grass-roots digital technology movements have a role to play in the construction of a bottom-up alternative to the top-down dominant view expressed through the promotion of a so-called "global information society". Homilies repeated for the past thirty years on the apparently inevitable rise of an "information society" have made this rhetoric commonplace, entrenching the quasi-certainty of this inevitably in the popular imagination. A similar message has issued forth from national governments, international organisations, and the large electronic entertainment, software and telecommunications industries. Critics have demonstrated that this rhetoric is bound to a pervasive groupthink-style approach steeped in neo-liberalism and appeals to globalization (Mattelart, 2003). That representation of a "global information society" has become the dominant *top-down* model for describing the future of Western societies.

The activities of the techno-activists described here contribute to a *bottom-up* model that anticipates the rise of a network of "shared knowledge groups" (Ambrosi, Peugeot, 2005). This alternative representation of the future information society contrasts with the unitary vision for an information society conceived in the boardrooms and cube farms of global multinationals. The bottom-up alternative was in evidence in Tunis in December, 2005, during the last World Summit on the Information Society (WSIS); it is a vision that expresses the position adopted by "organized civil society" as part of what economist E. Noam has called a "*third wave*" of *Internet leaders* (Noam 2005), more politicized than those of the first wave that emerged from the military, university and hacker milieux, and than those of the second, who were wedded to the Internet's encasement by market logics. The alternative vision of an information society associated with "shared knowledge societies" is rooted in the social practices of exchange and knowledge-sharing; these emerge from societies asserting their cultural diversity against a standard of cosmopolitanism (Beck 2006).

(Translated from French by Bram Abramson)

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Involving Users In The Product Development Of SMEs

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Abstract

One potential source of risk in product development is its distance from users. This risk is particularly apparent in small and medium sized enterprises (SMEs) which have limited resources to carry out tailored user studies. Additionally, mechanisms that support the adoption of innovations in business-to-business markets are less prevalent in business-to-consumer markets.

We attempt to develop practices for user involvement in the product development of SMEs. In particular, we have carried out four exercises in user involvement. These exercises were carried out together with SMEs that aim to commercialize automatic speech recognition services, a mobile blogging service for tourists, a hybrid media product for volunteer communities, and a learning news reader service.

In the exercises, we first wanted users to gain experiences of the service under development. This meant that users were involved by using a service prototype in three exercises and by participating in the development of product concepts in one exercise. Then we collected feedback from users and helped the product development team to reflect the feedback to the service in question. Product developers were present at all stages of the exercises.

The results of the exercises are encouraging. Small-scale, timely user involvement contributed usability and functionality improvements, input on how to enhance the utility and

enjoyability of the products, as well as new product ideas. Moreover, engaging in the user tests energized the enterprises to devote additional efforts to developing and improving their innovations. Face-to-face interaction between users and developers was highly appreciated by the service developers, and provided actionable information about users.

1. Introduction

The interface of information and communication technology has rapidly approached users during the last decades. Conventional media such as television and radio have evolved and new tools such as personal computers and mobile phones have diffused and developed quickly. This has brought numerous new possibilities for ordinary citizens to utilize these technologies.

At the same time this means that users have a larger say than before in how innovations are adopted. This is an unexpected type of user empowerment in the digital age. Instead of quickly adopting new technologies to utilize them fully, many users have opted to proceed slowly. Reluctant adoption has been evident in the digitalization of television, the mobile Internet and until recently, broadband Internet. These have all been important targets of the Finnish information society policy.

An obvious shortcoming of technology and information society policies is their distance to the end user. It is difficult to transform governmental policies of innovation and technology into successful commercial products and services for end users. Naturally occurring mechanisms of user-producer interaction exist to support the adoption of innovations in business-to-business markets but they are lacking in business-to-consumer markets.

One important reason for failed product development is a limited understanding of what end users value. This is particularly likely in small and medium sized enterprises which have limited resources to carry out tailored user studies.

Interaction with users is important for product development because it helps to focus efforts in the right direction. At the same, it is important to submit working prototypes to user testing to ensure that innovation efforts remain on the right track and preferably meet the users' requirements better.

In our research project we study how small and medium sized enterprises (SMEs) doing innovations in interactive computing respond to these two challenges. We report on methods for gathering user information and on the way in which user feedback modifies innovation. The overall aim of the project is to evaluate and develop practices for user involvement. We are particularly interested in how short term user involvement may benefit product development by introducing an extra loop or iteration in the product development process.

The enterprises involved in our study make innovations in the domains of community network services, game and entertainment applications, hybrid media, industrial and service company network services, and knowledge management applications. They have received funding from the Fenix program of the Finnish National Technology Agency Tekes, which plays an important part in the implementation of innovation and technology policy in Finland.

In our work we build on the theoretical frameworks of user involvement (Alam 2002, Lindsay 2003) and user innovations (von Hippel 2001, Haddon 2003). Our results suggest that there is a strong interest among the small and medium size enterprises to develop their knowledge of users and potential users, that user study methods are not considered as methods but they are implemented in practices, and that an open direct relationship with users and potential users seems to be a challenge.

2. User involvement and user innovation: issues for research and practice

A focus on users is one of the most topical issues in the new product development and innovation management literatures. In the following, the main arguments and methods for involving users are presented, and some of the problems encountered in user involvement are discussed – with a special focus on consumer-users.

Why are there so many calls for user involvement? The social shaping of technology tradition has pointed out that users are usually present in one way or the other when new technologies are invented (e.g., Bijker et al. 1987). Yet empirical studies indicate the user representations drawn on in technology development are often problematic and incoherent (Akrich 1995). The user representations most frequently employed are implicit, and product developers rely on personal experience (the “I method”, Akrich 1995) much more often than is commonly believed. Yet designers and users may be very different kinds of people. Increasingly, new users of technical devices are laypeople with little experience or expertise, and the user context is new and unfamiliar to the designers (e.g., Hyysalo 2004). Defining the user as “everybody” and using the “I method” lead to a disregard for important differences among users (e.g., gender and age), and place serious constraints on the development of technologies aimed for a broad range of users (e.g., Oudshoorn et al. 2004).

Usability testing has become a standard procedure in many industries (cf. Dumas, 2007), and there are a number of standards for usability testing and human-centered design. Traditionally, usability research focused on functional aspects of the technology: efficiency, effectiveness and user satisfaction, conceptualizing the user as someone performing a clearly bounded, pre-specified task. In the past few years, usability research has taken on board a number of new challenges (Karat and Karat 2003). Usability researchers have recognized the need to develop a more profound understanding of the contexts of use. Participatory design has also become a popular topic, as well as the inclusion of other than purely efficiency criteria (e.g., “user satisfaction”). For example, Monk (2002) has examined the new challenges involved in designing information technology products for the home, such as including fun, social interaction and dependability into a broader view of usability.

In information systems, there is also a long-standing tradition of research into technology acceptance and the determinants of technology adoption. A large body of research in this field is based on attitude-behavior models, and aims to identify factors underlying the acceptance, adoption and use of information technologies (e.g. Venkatesh et al. 2003, Davis et al. 1989). This stream of research, however, says fairly little about the cultural and contextual factors that underlie the attitudes and behavioral intentions measured in surveys (cf. e.g., Higgins 2000). The acceptability of new technologies and product innovations is also an evolving issue – new interactive ICT products may have significant social consequences and involve ethical design issues that need to be acknowledged in early stages of the design process (Whitworth and de Moor 2003).

2.1 A diversity of approaches to user involvement

A number of reviews have been recently published on user involvement methods. For example, Kaulio (1998) reviewed seven different usability methods (*quality function deployment (QDF), user-oriented product development, concept testing, beta testing, consumer idealized design, the lead user method and participatory ergonomics*) with an aim to identify different forms of interaction between users and designers. Kujala (2003) reviewed four common approaches to user involvement (*user-centred design, participatory design, ethnography and contextual design*) from the perspective of their benefits and challenges. It is telling that none of the methods reviewed in the two articles have the same name, even though some refer to overlapping or similar methods. Further concepts introduced include user groups (Tomes et al. 1996) and user modeling (see e.g., Fischer 2001), as well as the lead user approach (von Hippel 1986; Lilien et al. 2002).

The existing methods differ on at least the following dimensions:

- *Industry focus*: many of the methods have been developed in the field of information systems and ICT (see e.g. Karat and Karat 2003; Kujala 2003). There are also methods used primarily in the consumer durables and other consumer goods industries (Kaulio 1998). Industrial engineering and ergonomics have been the origin of many participatory design initiatives, which have since also made a significant entry into IT-design (Brockhoff et al. 2004). An emerging issue is user involvement in the design of “traditional” services such as financial services (Alam 2002) and new ones such as mobile telecommunication services (Magnusson et al. 2003).
- *Users in focus*. In some cases, the term used is “customer involvement”, in which case customers may refer to well-identified and long-term business or organizational customers. In a company context, the actual users of the products may, however, be a totally different group than those making the purchase decision – in which case, “user” may refer to “shop-floor” users. Consumers are often the most problematic type of users, as it may be difficult to identify and contact representative consumers (e.g., Heiskanen et al. 2005), which is why consumers are often studied using surveys (Choudrie and Dwivedi 2005).
- *Focus on users’ ideas and requirements vs. users’ experiences*. Methods such as quality function deployment (Kaulio 1998) and idea-generation (e.g., Magnusson et al. 2003) aim to discover user requirements or generate new product ideas. They thus approach the user from a ‘clean slate’ perspective, with no specific product in focus. On the other hand, methods such as beta testing or concept testing allow users to interact with first versions of the product, see how it fits their everyday life, and provide their comments on this basis (Kaulio 1998; Hyysalo 2003).
- *Focus on participation vs. investigating the user context*. Participatory design aims to invite users to “join the design team”, and it involves a normative element of democratizing design (Kujala 2003). Direct participation also usually involves face-to-face interaction between users and designers (Tomes et al. 1996, Hyysalo 2003). In contrast, field studies such as ethnographic research and different kinds of product testing settings allow researchers to identify issues in the user context that may be difficult for users to verbalize (Kujala 2003).
- *Timing of user involvement*: Users may be merely involved by eliciting their requirements using questionnaires or interviews at an early stage of product development – after which

the designers or developers draw their own conclusions. Users may also be involved in concept testing by asking them to evaluate models, mock-ups or prototypes. In later stages, users may be involved in product testing or long-term studies such as ethnographic research. Kaulio (1998) identified three main phases in which users are involved: specification, concept development and prototyping.

The methodological diversity gives a mixed impression of the benefits of user involvement. In any case, it can be seen as an indication of that the field is still emerging. Appreciative practitioners may also wish to see multitude rather as a resource than as a potential source of conflict (cf. Hyysalo 2006).

2.2 Beyond user involvement: users as innovators

As mentioned above, ordinary users' lack of experience and expertise has been one of the arguments for increased user involvement. A quite different argument is put forth by the literature focusing on "lead users" and the role of sophisticated customers in product innovation. This perspective originated in research on specialized industrial and professional products, in which users may in many cases be the primary source of innovation (von Hippel 1988) – and are, in this case, quite similar to the customers of make-to-order or tailor-made products (Brockoff 2003). Later on, von Hippel and colleagues have extended the lead user approach to consumer products. In this context, lead users are defined as those who (1) face needs that will be general in the market place, but face them much earlier than the bulk of the market, and (2) who are positioned to benefit significantly by obtaining a solution to those needs (von Hippel 1986).

Important, innovative consumer user communities have been identified, for example, in the computer games industry, where online consumer communities communicate and extend the game from its original format by exchanging ideas and software (Jeppesen and Molin 2003, cf. Heiskanen et al. 2007). Sports such as windsurfing, skateboarding and snowboarding are other examples of fields in which user communities have had an important role in product innovations (Shah 2005). Enterprises have tried to harness this important source of new innovations and link it more closely into their own product development process, e.g., by setting up support functions that assist user-driven innovation, offering users toolkits that facilitate their participation in the design process, and making systemic use of interactions with consumers in order to learn from their innovations (von Hippel 2001, Jeppesen and Molin 2003) or even recruiting members of such communities (Kotro 2005). A similar approach can also be used to support user innovation in more mundane fields of interest (Haddon 2003, Repo et al. 2006a).

2.3 Prospects and problems of involving users

As the interest in user involvement mounts, it also becomes more and more evident that the research and practice in this field is largely at an experimental stage. While the importance of user involvement is generally acknowledged, a number of problems have also been identified:

What is the role and expected input of the users? Are users a source of information on the user context, a source of new ideas, partners in the product development process, or providers

of useful feedback? Obviously, users may have all or any of these roles, but the expected input of users, and the ways in which it will be used do not seem to be very clear at the start of all user involvement projects.

Are users capable of presenting useful information? It is often noted that users may find it difficult to verbalize their needs (termed “sticky information”, by von Hippel 1998), or may themselves be unaware of their requirements (Riquelme 2001). This observation motivates the use of field methods such as ethnography, or forms of product testing that are strongly directed by the product development team. Obviously, merely “asking users” (through, e.g., surveys or idea competitions) is an inadequate approach. There are, however, methods through which users can be progressively involved in the design process (e.g. Tomes et al. 1996) or in which user ideas can be used indirectly as a resource for learning in product development (Lemasson and Magnusson 2002).

What kinds of users should be involved? While user involvement and acceptability approaches highlight the importance of understanding “ordinary” users and acknowledging the diversity of, e.g., the current and future users of ICT applications, the lead user approach explicitly questions the role of “novice” users in generating useful product ideas (e.g., von Hippel 1986). “Ordinary” users are problematic in many ways. In consumer products, it is difficult to involve a representative group of the diverse population of potential users, and the capabilities and motivation of ‘ordinary’ users may be limited. Yet the concept of “lead users” is still very much under development in the context of consumer products, too – it is not always obvious who are such lead users, and whether they will be eventually followed by the mass market, or whether they represent specialized market niches.

What are the costs and benefits of user involvement? From the producer’s perspective, Kujala (2003) has considered the costs and benefits of user involvement, showing that user involvement may be a costly process that requires time and effort, which does not automatically lead to better design. In most cases, however, this effort is merited by cost savings due to design failures or problems (see also Brockoff 2002).

How are users integrated in the product development process? Integrating expertise in product development is always problematic (Buijs 2003; Kotro et al. 2005). User involvement appears to encounter similar problems (Kujala 2003): participatory design may be conducted in isolated projects, designers may be unwilling to engage with users, user involvement may disrupt time-limited product development cycles, and methods such as field studies and ethnographic research may generate an excess of raw data. Magnusson et al. (2003) have indicated that ordinary users’ ideas may be unrealistic and excessively fanciful, and need intensive processing in order to make a useful input into the design process. Thus, user involvement requires intensive management in order to be truly useful.

Thus, it appears that user involvement is important, but not easily implemented. Different types of innovation and product development problems obviously call for different forms of involvement. Similarly, the role of lead users vs. ordinary people may vary at different stages of the innovation process. It seems to be important to understand that user needs are not pre-existing, but evolve gradually (Hyysalo 2003). Much consideration needs to go into planning the form of user involvement used: what kinds of users should be involved, at which stage of the innovation and development process, and in which way? It also appears to be clear that user involvement does not automatically solve the problem of incoherent and non-convergent user representations (cf. Akrich 1995) – it is equally important to involve technology and

product developers in integrating the information gained from users at different levels and stages of the innovation process. Obviously, much work remains to be done in this field.

3. User involvement as a practical exercise

The practical exercise of user involvement is studied within the framework of the Onni-project, which is a joint project by the Finnish Funding Agency for Technology and Innovation (Tekes) and the National Consumer Research Centre in Finland. The project investigates how SMEs involved in the Fenix technology programme on interactive computing obtain and manage user knowledge, and how current practices could be improved. Tekes will use the results of the project to determine how to promote better user management practices among the companies in its technology programmes and by the policy implications arising from the project. An essential aim of the Onni project is to assess current practices and experiment with intensified user interaction together with selected SME participants.

Our preceding survey of how SMEs in the Fenix programme obtain and manage user information indicated that designers' personal experience and gaining impressions from the media were dominant sources of user information. Customers and previous studies were also frequently used as a source of information about future users. Some enterprises did engage in formal user research efforts, such as focus groups, testing pilot products or market surveys. Yet most enterprises viewed learning about their potential customers the largest challenge. Many were eager to test their products with a broader group of users, and considered it important to develop systematic means for collecting and managing user information. As was to be expected, financial resources and time were the most frequently mentioned obstacles to user involvement – but lack of capabilities did play a role, as one respondent stated: “there is certainly room for improvement, but it is hard to say exactly how”.

Similarly, our preceding survey of usability and user research service providers indicated that SMEs in the industry rarely use such services. They are concerned about costs and consider the benefits uncertain. User studies are usually contracted too late, and sourcing user studies requires skills and understanding that many enterprises lack. Yet younger people in the customer enterprises have learned to appreciate the importance of “knowing the user”, and perceive it as part of good customer service quality. According to the service providers, the acquisition and management of user knowledge could most effectively be promoted by informing enterprises about its benefits.

3.1 Building a practical approach

We have used the three identified issues in the literature review as a starting point for the practical exercise of user involvement. Firstly, we have attempted to make use of a number of aspects of the diverse approaches to user involvement. We have particularly focused on users, their participation and experience, and the timing of the exercises in the innovation process. In this sense, we have been more user-centered than is common in usability testing. At the same time, however, we have also been communicative with product developers, allowing them personal participation to an extent that is also beyond market research.

Secondly, we have attempted to keep our research design open to leave room for the potential emergence of user innovations. Thirdly, we have attempted to use our experiences to

recognize the prospects and problems of involving users. We report on these as challenges for user involvement.

In addition to the literature review, our approach stems from surveys of 14 SMEs carrying out product development and seven consultancies providing services in usability and user research. The companies participating in the surveys called for feasible solutions to practical problems. Weighing benefits against costs was also emphasized, which promoted the idea of short term intervention exercises.

The starting point of our approach is to gather experiences for our users of the products being developed. Experiences are gathered through the use of a prototype version of the service in question in its intended context. Then we gather insights from those experiences by means of focus group interviews and questionnaires. The insights are reflected in discussions with product developers. The aim of the exercises is to provide impetus and possible reassessment in product development.

This approach combines a number methods used to gather information on users (cf. Hyysalo 2006). We have carried out interviews, observed use, conducted usability trials, tested prototypes, and situated the use of services in their contexts. In essence, little attention has been paid only to product developers' experience and presuppositions, and external expert knowledge.

3.2 Four cases of user involvement

The exercises carried out in the project all represented technologies and services that are new to both service providers and users (Figure 1). In this respect, user involvement *per se* was a particularly suitable approach to gather data on potential users (Hyysalo 2006). An additional common element was the use of technology for interaction between users or between users and technology.

Three of the four exercises focus on technologies that are at a functional stage and, therefore, can be tried out by users. A service based on speech recognition was used to reserve a doctor's appointment at a health centre by telephone (Heiskanen & Hyvönen 2006). A moblog service (taking pictures and posting them on the web) initially developed for the business leisure market was tried out on a sightseeing tour by non-business tourists (Repo et al. 2006b). An exercise involving a news portal that learns about the interests of its users is currently in process.

The fourth exercise focuses on the development of hybrid media concepts to support community interaction, in this case the interaction between members of a community of football volunteers (Forsell et al. 2007). In this particular exercise, users came up with a concept that was focused more on external communication between the football club and the broader community, rather than interaction among the volunteers. Quite interestingly, an approach building on empathic design and involving others than the volunteers came up with concepts that were more focused on the communication needs between volunteers.

Figure 1. Description of exercises.

Generating service concepts by and for volunteers ¹

Personalizing news

Making phone services simple ²

Moblogging while sightseeing ³

Picture credits: ¹Mika Saastamoinen, ²Permission to use picture granted by Suomen Puheentunnistus Oy, ³Petteri Repo

The product innovators' general interest in user involvement, which was evident in our preceding survey, also became practically evident in the four exercises. Accordingly, we could come up with ways of focusing methodological insights in user involvement toward the practical interests of the participating SMEs.

It also turned out that a certain level of user innovation could be secured in the involvement process. This meant that users could bring forth ideas that the product developers initially did not consider relevant, but which they came to appreciate during the involvement process. We also found that practical user involvement exercises benefited from variations in standard methods to make them more appropriate for specific problems and contexts (Table 1).

Table 1. Four cases of user involvement.

	Community interaction	Learning newsreader	Speech recognition	Tourist moblog
Prototype description or aim of involvement	Concept of hybrid media for communication between volunteers	Demo of web portal that learns users' interests	Demo for reserving doctor's appointment	Transfer of service from b2b market to b2c market
Focus	Concept modelling	Insights in new way of reading news	Functionality of service, applications of technology	Adaptation of service for non-business tourists
User innovation or outcome	Concept modelled by users	* The case is still in process.	Insights in heuristic interaction with technology, applications	Solutions for support services
Methods	Empathic design, participatory design	Trial, focus group interviews, questionnaire	Trial, focus group interviews, questionnaire	Trial, focus group interviews, questionnaire

Interviews conducted with the involved SMEs after the exercises confirmed that the exercises had been considered beneficial for product development. An obvious benefit was feedback on technical issues and usability. User involvement was one way of providing such feedback, although arguably similar feedback could have been obtained from professionals.

A benefit that was more closely related to user involvement involved non-technical aspects. Many of the user innovations had to do with situations of use rather than the features of the service being developed. In particular, the users came up with ideas that they considered missing or underdeveloped. Examples of such issues included maps for guidance and the risk of theft.

Finally, one perhaps often overlooked benefit of user involvement related to personal engagement in the involvement process. Direct contact with users was a memorable experience for product developers. Initially, product developers came to look for solutions for their problems, but instead received insights stemming from users' experiences. This process was partly painful, but was also considered rewarding.

3.3 Prospects and challenges for user involvement

We recognized a number of prospects and challenges for user involvement when conducting the exercises. These relate to the methods of users involvement and the utilization of the results of user involvement in the product development of SMEs.

Many of the methods of user involvement presented in literature have been designed thoroughly and comprehensively. SMEs are likely to have little resources to carry out such methods to a full extent. In our exercises, short term user involvement produced benefits without extensive use of resources which the participating SMEs appreciated. Involving users – even in a limited scale – was arguable better than doing nothing at all. On the other hand, there are obvious risks in carrying out lightweight short term exercises in user involvement. In particular, product developers' views on users may become or remain biased (cf. Akrich 1995). Caution is needed when balancing the benefits of such exercises against the risks.

It may also be difficult for product developers to utilize the results of user involvement. The product development of many SMEs builds on an overly positive enthusiasm. This may result in utilizing on such results that conform with this enthusiasm. Action rationality then dominates over decision rationality (Brunsson 1985, Heiskanen & Repo 2007). On the other hand, user involvement itself seems to introduce an element of decision rationality as it challenges a straightforward product development process.

Due to the schedule of the product development process, the benefits of user involvement may sometimes be used only in succeeding versions of the product. This means that user involvement cannot necessarily provide a final solution to urgent issues in product development. Therefore, it may in some cases be worthwhile to adopt a strategic view alongside an instrumental view on user involvement. The timing of user involvement may be as much related to the phase of the enterprise as it is to the phase of the product being developed (cf. Kaulio 1998).

4. Discussion

User involvement is highly topical in several disciplines and fields of practice. New methods are being continually developed and tested, such as contextual design, empathic design, participatory design and the lead user method. Current topics of interest include the issue of how users are represented and how their perspectives are mediated into the design process. For example, when should we include experienced and expert users, and when should we include 'ordinary' users? How are users capable of providing valuable input on products that do not yet exist, and how useful are different methods in generating the necessary user experience? Another topical issue is how the input gained from user studies and involvement exercises is converted into practical design solutions, and how useful different forms of user input are for enterprises developing innovative products.

We have conducted four short term user involvement exercises with small and medium sized enterprises (SMEs). These enterprises' innovations were at different stages, ranging from the development of product concepts to the testing of new application prototypes. The results of the exercises are encouraging. The enterprises gained obvious benefits from the user involvement exercises that we organized for them. Small-scale, timely user involvement contributed usability and functionality improvements, input on how to enhance the utility and enjoyability of the products, as well as new product ideas. Moreover, engaging in the user involvement exercises energized the enterprises to devote additional efforts to developing and improving their innovations.

Along the benefits of user involvement, we recognized a number of caveats. These had to do with the methodological risks of lightweight involvement approaches, the abilities of the SMEs to utilize the results of user involvement, and the stage of the product development process. It would appear that SMEs need to assess their situation and resources more comprehensively than literature suggests.

The user involvement exercises confirmed some of the issues identified in the literature review and in the service provider interviews. For instance, it has been previously noted that externally produced studies may be difficult to integrate into the service development process. Face-to-face interaction between users and developers was highly appreciated by the service developers, and provided actionable information about users. It can be recommended

that if product developers in SMEs wish to involve users, they should be prepared to engage themselves in the involvement process.

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Designing Urban Mediator

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Abstract

This paper reflects on the steps taken so far by our multidisciplinary research team to address the design of what we have called "Urban Mediator"; an open framework and specific tools for building connections between citizens and city administrations, making all knowledge mutually accessible.

Taking Urban Mediator from the conceptual level into a tangible design solution is being done incrementally, following a co-design approach involving identified stakeholders, to the extend possible. This paper introduces the Urban Mediator concept and describes the co-design process so far (work on Urban Mediator is still in progress), presenting both the meta-level strategies that guide the whole work process, as well as the practical strategies used to maintain the co-design approach possible, particularly addressing the way they drive the software design.

Introduction

Urban Mediator has started as a concept idea for an open framework and specific tools for building connections between citizens and city administrations, making all knowledge mutually accessible (ICING DoW 2005). This concept is based on previous design research and proposal for addressing the possibilities presented by the interweaving of new digital technologies and urban space, for encouraging various forms of public participation on urban issues (Saad-Sulonen 2005).

The idea is not to create yet another interaction channel, like the various websites, portals or discussion forums, but rather come up with a system that would help citizens know of the existing channels and services and help them decide in what way they'd want to interact with the official city. Urban Mediator would make it possible for people to send information, questions, complaints, and remarks regarding their neighborhood, linking them to existing interaction channels, as well as receive both official and non-official information. Citizens, residents associations as well as various city administrations are plugged to the Urban Mediator, making it easier for them to reach the information they need regarding the city, when they want it and where they want it. The system would also permit them to organize themselves around issues of interest, in the way social software works.

Urban Mediator is currently being developed into a working prototype within the framework of the ICING project. ICING, an acronym for Innovative Cities for the Next Generation, is a 6th framework programme EU funded IST (Information Society Technologies) project, scheduled to run from January 2006 to June 2008. According to the project's official

description of work, ICING's goal is to "research concepts of e-Government based on a multimodal, multi-access approach to a 'thin-skinned City' that is sensitive to the citizen and to the environment, using mobile devices, universal access gateways, social software and environmental sensors." (ICING DoW) The project partners include city councils, universities and telecom operators from Barcelona, Dublin and Helsinki. (<http://arki.uiah.fi/icing>)

Urban Mediator is the key concept to be developed in Helsinki's test-bed of Arabianranta. Within the ICING framework, Urban Mediator will act as one subsystem of the ICING platform, whose role will be to provide services and information that better connect the City with its constituency. Urban Mediator's role within the ICING platform would be to facilitate the citizen-driven possibilities for action.

Urban Mediator is however an independent system in itself and can exist in various frameworks. One of its important aspects is to offer possibilities for a variety of other systems to plug into it, creating the mediating potentials. The scope of this paper does not include the particular development work that engages the parallel process of collaborative work with ICING partners for integrating Urban Mediator into the ICING platform. The paper will focus on presenting a reflection on the co-design process involving stakeholders in the area of Arabianranta in Helsinki.

Urban Mediator Concept

There are various sources producing different types of knowledge about a city. The most visible one is the formal knowledge that the City administration produces, and which is official and expert. There are also some other formal channels such as neighborhood or political activist organizations that collect and use knowledge of the city. Last but not the least, citizens also produce knowledge through their lived experience. This latter form of knowledge about the city is embodied in people's daily activities and communicated in informal and extremely diverse contexts. It is worth noting that some of these communications means are becoming digital, taking the form of personal and community blogs, contributions to discussion forums, and digital photo pools. Urban Mediator would try to create interfaces for making these different forms of knowledge mutually accessible to all the stakeholders.

The concept of Urban Mediator aims at increasing the level of democratic involvement, in particular eParticipation, by providing an example of a "mediator" environment where these different kinds of knowledge are mutually accessible, making it possible for citizens to interact with each other as well as with city authorities. Furthermore, linking to that the possibilities for computer-mediated interaction in the space of the city itself (mobile technologies, Wi-Fi, GPS etc.) expands possibilities for information sharing and taking action into the street, the everyday context of the experience of the city.

The Urban Mediator concept is that of a software and related services that will enable users (citizens and city administration) to obtain and share information about a city neighborhood. This interaction can happen in situ, in the physical space of the city, using mobile devices, or it can happen using any computer with Internet access. The shared information can be official information, as provided by the various city administrations and offices, or information provided by citizens directly to Urban Mediator or already existing on the web. The use of interactive maps facilitates the visualization of such location-related information. In its final

implementation stage, Urban Mediator would also provide a set of tools that would facilitate the creation of projects or discussions related to a local issue of interest.

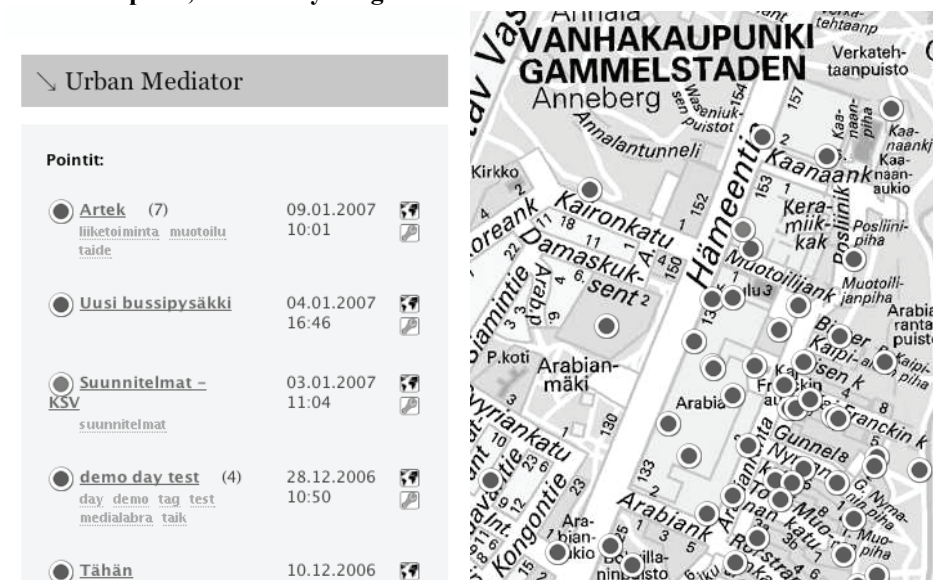
Urban Mediator Current Stage

Urban Mediator’s development has started in June 2006 and is planned to last until December 2007. The areas of development of Urban Mediator were at first defined in a way that reflects both the framework of the ICING project – an IST project addressing objectives of Priority 2.4.9 ICT research for Innovative Government [1] - and the research and design interests of the research team - understanding how ‘social’ factors as well extending the interface for citizen participation and involvement to the everyday experience of urban life could invigorate eGovernment services and eParticipation. The areas of design development have then, through research and co-design work, crystallized to the following: in-situ access and contribution to information, harvesting existing relevant online information, and providing tools for citizens to organize themselves around issues.

At the time of writing this paper, Urban Mediator already exists in the form of UM Stage 1 prototype, which allows users to annotate points on a map of the area they live in. Points can be commented and are accessible through different navigation strategies. The views provided are a map view with points, a most recent comments view, a “tag cloud” view to navigate with keywords and other views.

Urban Mediator Stage 1 software has client-server architecture. Any graphical web-browser can serve as a client, making it possible to test using not only computers, but also 3G mobile phones. Mobile clients with GPS device can make use of the special Python (S60) application to provide UM with geographical coordinates. A Geofeed from UM allows the use the map server of the City of Helsinki for map portrayal.

Fig. 1 shows two screenshots of the Urban Mediator prototype. The user interface, the same for mobile and desktop use, is still very rough.



Work is also almost done on harvesting, which is a process of gathering existing relevant online information. Urban Mediator doesn’t pretend to contain all information relevant to the urban environment and life. Instead, it leverages on the information available from numerous

sources. It is quite common today that organizations and businesses have their news and events in the form of web feed. Urban Mediator may incorporate that information and present it in connection with given place and time. For example, student theatre with an RSS feed may advertise itself in the Urban Mediator according to spatial position of the user. In order for information to be available for the Urban Mediator, a properly described link should be given by the users. Gathered data, which is available for viewing and browsing, can be further refined by more accurate tagging, summarizing, moderation, recommendation, etc. Urban Mediator would also have regular feeds, like an official feed from the city council's web-portal or various city offices departments, as well as feeds from neighborhood and community websites.

A Co-Design Approach

By co-design, we understand a collaborative design approach that includes development of strategies for active participation of various identified stakeholders throughout the design process and beyond it. The decision to follow a co-design approach stems first from the research group's interest in following and developing such an approach (Botero et al. 2003). Co-design is influenced among others by participatory design (Schuller and Namioka 1993), situated design (Greenbaum and Kyng 1992), and the Scandinavian research on system development (Bjerknes and Bratteteig 1995). It also includes the idea of extending the co-design of an initial outcome to be possible through its use by people.

In the case of Urban Mediator, the use of a co-design approach is particularly interesting as it gradually sets the ground for a possible future 'real' use of Urban Mediator in the neighborhood of Arabianranta where it is first set to be developed and tested. So, not only does the co-design approach offer the possibility to iteratively explore with stakeholders (in the case of Urban Mediator the stakeholders are potential users, information providers, authority figures, designers), what would be relevant features for the software and refining the service possibilities, but it also makes it possible to gradually populate the Urban Mediator working prototype with relevant content, preparing the prototype for future public use. This is important as it reflects the very nature of Urban Mediator as a system whose content is not pre-provided by any particular actor but is rather continuously provided by stakeholders, either directly, or through established feeds from various relevant sources.

Meta-strategies: developing common language and favoring a tool-based approach

Without some kind of a common language, it is impossible to draw together the stakeholders that would become involved in the co-design process. Communication indeed lies at the heart of collaborative design and the success of the design process depends upon the capability to create a shared understanding amongst all involved stakeholders (Erickson 1995). Designers (users-as-designers and professional designers) exchange technical design possibilities and design requirements and use cases. Effort is therefore put on producing the artifacts that would permit the common language, such as scenarios, sketches, reports, workshops and prototypes (Erickson 1995). Effort is also put in using appropriate naming for the key concepts of Urban Mediator so as these terms used mean roughly the same for all involved stakeholders

Taking co-design a step further also means designing systems that allow users to continue their (co-)design of the system, through use. This ties closely to Henderson and Kyng's understanding of "design as a process that is tightly coupled to use and that continues during

the use of a system” (Henderson and Kyng 1991). This is very relevant for Urban Mediator as it helps address the possibility of creating tools for users rather than fixed solutions for encouraging public participation in urban issues. From a software design perspective, this also means that co-design approach sets the ground for flexibility and openness. In that sense, we can say that the essence of a system such as Urban Mediator is its open nature: it presents opportunities for mediation between various producers and seekers of information related to life in the city, citizens and officials alike. Moreover, an open system can support collaborative design and presents opportunities for being shaped through use. Addressing this issue in an article advocating the need for developing frameworks for end-user development of ICT based systems, Fisher and Giaccardi (2004) clearly articulate the benefits of open systems: “By creating the opportunities to shape the systems, the owners of the problems can be involved in the formulation and evolution of those problems through the system”.

These meta-strategies provide a grounding focus for the design process and can be considered as what Nelson and Stolterman (2000) call the “guarantor of design”, or the attempt to find some solid and dependable base for design actions. However, involving the stakeholders in design process is not easy. The effort in pursuing a co-design approach requires also more practical steps and strategies that are interweaved in the design and development process itself. These practical steps and strategies undertaken within this guiding focus are presented in the next sections.

Co-Design Steps

It is important to note how the co-design approach in the Urban Mediator case spans through the whole project timeframe, addressing the various aspects of development emphasized by the inter-disciplinary approach to design. (The team includes members with backgrounds in software design, industrial design, architecture, and at an initial stage, social scientists). Moreover, co-design activities have been set up in relation to the identified areas of development of Urban Mediator (see above) and has helped crystallizing them.

The phases of the co-design process are closely related to the stages of design articulated by Erickson (1995): Exploration, Refinement and Transition, but are not strictly delimited as such (see Table 1). In the case of Urban Mediator, it is important to also pinpoint the initial steps of setting the stage for co-design. The very first co-design steps have been to identify the relevant stakeholders for such a system as Urban Mediator. This is characterized by researching the context and establishing contact with various actors in that context. In the case of Arabianranta, key players such as the Art and Design Company [2], active residents and communities, as well as various representatives of the city authorities were contacted. Meetings were organized with these people where the idea of Urban Mediator, as well as the ICING project, were presented. As a result initial, the mapping of important stakeholders and possible co-design contacts from the different stakeholders groups were established. Furthermore, scenarios of Urban Mediator were created based on these initial findings and a short animation was made to explain them. The animation was then later used in future meetings and talks with stakeholders and constituted an initial step in setting a common language.

This initial phase is crucial in the case of Urban Mediator as beyond setting the stage for the exploratory and refinement stages, it also prepares the ground for establishing how Urban Mediator would exist once brought to public use and who would be the parties involved in

using it, but also hosting it. In a way, in the case of Urban Mediator, this initial stage already interweaves with Erickson's third stage of design, that of Transition.

Further exploratory steps related to reaching an initial stepping stone into the development process have been to send a small questionnaire and devise a set of low-key workshops with active residents in an effort to identify potential use cases for Urban Mediator. The questionnaire was sent by email to members of the Arabianranta Residents and Parents association and members of the Arabianranta Moderators group [3], asking them where they get information regarding Arabianranta.

The two workshops were then organized: one with members of the Arabianranta Residents and Parents association, and one with members of the Arabianranta Moderators group. The workshop participants were asked to place on a paper map of Arabianranta, issues which they felt they'd need information about, and to discuss how and where they would get or would like to get such information.

The results of this initial phase, showed that it was clear that citizens needed information about construction sites, traffic issues, parking space, day care shortage, services, interesting places, routes etc. It was also clear that many city office employees would find it beneficial to have access to information produced by citizens, about their area and where especially interested in the idea of a map that would show this citizen-produced information as layers. These considerations have constituted the framework into which the iterative design and development work proceeds.

The next phase which we have recognized as being the interactive and iterative one, or Erickson's Exploratory stage, is that of user involvement and prototype building. This stage particularly addresses the practical strategies driving the software design and is explained in the following section.

Table 1 shows the co-design steps taken so far

		Design team	Residents	City Office	Others
Refinement	Explorations		Arabianranta Moderators (meeting)	Meetings/interviews with officials dealing with the physical environment	Art and Design City (meetings)
	Initial explorations		Arabianranta Moderators: Media Folder experiment (re-purposing software)	Meetings/interviews with officials dealing with the social services	Arabianranta's workgroup (meetings)
		Prototypes	Arabianranta Moderators (workshop) Questionnaire to residents Workshop with Residents' and Parents' Association members (paper and pen) Workshop with moderators (paper and pen)	Meeting with the Helsinki City Planning Department Meeting with the Public Works Department	
	In-situ access and contribution to information	Prototypes	Urban Mediator Stage 1 (prototypes)	Trial with volunteers from City Youth Department (Prototype – no action) Arabia School (meeting – showing prototype) Public Works department (meeting – showing prototype)	
	Harvesting	Prototypes			Workshop with Art and Design City (discussing prototypes – adapting existing software)

Practical Strategies Driving The Software Design

Following an iterative co-design approach means that we would not first gather all the requirements and then build software for the rest of the time. We decided that during Urban Mediator development quick changes and utmost flexibility will be needed. Software development tools we have chosen to build Urban Mediator are web.py (web framework written in Python) and MySQL database, and the way we decided to build software was through a series of lightweight prototypes. This approach is not a conventional way of building software solutions and actually it has discrepancies with "established" software engineering methodologies (such as having complete functional analysis and set of detailed

use cases). Software co-design methodology however bears many similarities with agile methodologies, as reported in the online document Manifesto for Agile Software Development (<http://agilemanifesto.org/>). Agile methodologies especially value “customer collaboration” and “responding to change over following a plan”, which are quite similar to the ideas of collaborative design and continuous design through use.

We present here three examples of practical strategies that have driven the software design and that are embodiments of the guiding meta-strategies presented earlier.

Accessible conceptualizations

Finding common language - concepts equally well understood by professional designers and other stakeholders - is crucial to the success of co-design as it allows all engaged stakeholders to see technical and social possibilities in the solution domain.

Urban Mediator is, among other things, dealing with facts. In the early stages of UM development we came up with simple fact representation model: What-Where-When-Why-Who contexts we refer to as W5. The model helps to comprehend the emerging design spaces of the Urban Mediator. While the "Where" context seem to be mentioned more often than others and is more used in the visualization of Urban Mediator data, other context are not ignored.

While somewhat oversimplified, viewing Urban Mediator as the index of points in multidimensional W5 space of facts helps to comprehend not only the design results, but the design process as well. For example, a user suggestion or feature request may be analyzed by projecting the information model, needed for the feature to work, into W5 space. If the feature requires more than just changing user interface, the underlying data model may be revised, and there are usually no problems to interpret additions according to W5.

The W5 model can be understood by all stakeholders: users and HCI specialists understand facts in terms of What, Where, When, Who and Why as their meaning in everyday language; software designers have no difficulties to translate those into aggregates of data structures. Finally, graphic designers also benefit from knowing that UI should reflect those contexts. As a concrete example, during UM development (user interface for adding new data point), it was easy for all stakeholders to refer to the sequence of data input actions in terms of W5, and changes could be directly made to it.

Another useful concept, which emerged through UM design, is that of “Point” (not as geometrical point but rather as the point in a discussion or dispute). In UM stage 1 "point of discussion" has been tied with point on the map and comments added to the point constituted discussion itself. It was beneficial at that time to have a good metaphor, so users were not at loss why what it means.

Re-purposing and adapting existing software

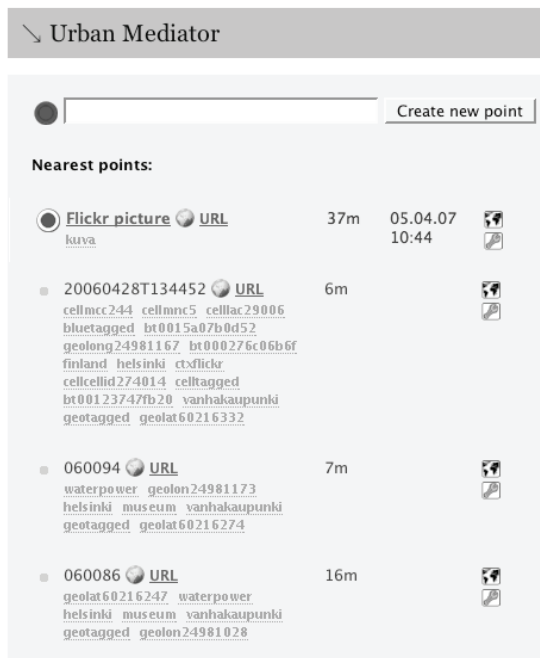
Re-purposing existing software makes it easier to quickly engage people in co-design activities and helps the software team to have head start in the project.

The first Urban Mediator prototype was code-named "UM Embryo" and has been built with the Media Folder ("Kori") software of another project the research group was involved in. In a nutshell, a Media Folder is a folder for sharing media material among its users with ability to call other users. Images, sounds, text and videos can be put there. Media Folders could belong to a group of users (a family), and would then constitute a "Family Folder". The process of creating new Media Folders inside Family Folder was easy. For a Media Folder to be adapted to represent a place to gather information, a special, simpler, version of Family Folder was build and called Community Folder. The re-purposing took nearly one man-day and the resulting solution has been used to demonstrate the idea of Urban Mediator to stakeholders and to quickly ask them to contribute to information regarding their neighborhood to what we had set up as an "Arabianranta" Media Folder. As a result of this exercise, we were able to quickly gather examples of what people find interesting to report to others, particularly by documenting through picture taking.

The Web 2.0 direction of WWW also shows a lot of examples how existing online software can be adapted to the needs of special-purpose designs. In the course of designing Urban Mediator constant attention has been made not to overlook existing online components that could complement and enrich UM functionality, or provide it with spare parts (Floyd 2006). One of the examples is Google maps (<http://maps.google.com/>), which with very little effort, can be used to create mashup of Urban Mediator data and Google maps map portrayal service. Mashups are very close to the idea of Urban Mediator itself, and therefore using them as prototypes gives concrete examples of certain features of Urban Mediator.

Another interesting example of is the use of Flickr (<http://www.flickr.com/>) web feeds powered by location information as a way of describing the Harvesting features to stakeholders. It is easy to get feed from Flickr based on keywords and Urban Mediator can display feed entries on the map. It is not in itself something unique because Flickr has its own map engine. What is making it valuable is the ability to treat Flickr entries as points of Urban Mediator, for example, referring them in discussions. Web feeds from Flickr have been implemented to Urban Mediator prototype and showing them to particular stakeholders (those in charge of websites containing Arabianranta-relevant information), during a workshop on the harvesting theme, has helped them understand the notion of using web feeds to populate Urban Mediator with relevant information.

Fig. 2 shows a screenshot of experimentation with using webfeeds as a means of harvesting information about Arabianranta



Furthermore, consideration of adapting existing software made it simpler to consider what should not be part of Urban Mediator design. Namely, it was explicitly stated that Urban Mediator is not a system for annotating maps, it is not a discussion forum or a blog software: but all those components can be used to make Urban Mediator more useful. As a consequence, Urban Mediator domain logic is quite unique and focused to specific purpose. All “usual” features, expected by users, (e.g. photo sharing or storing bookmarks or discussing topics) can be linked to UM by users themselves.

Building software through lightweight prototypes

UM development is done through iterative rapid prototyping to ensure we can engage all stakeholders in the process. We advance in the understanding of the context and the domain (citizens’ lived experiences of the city) at the same time we advance with the software development. From a software engineering perspective this means we are incorporating elements of Agile methodologies (Cockburn 2002) that fit very well with our understanding of co-design.

After initial success of the prototype using re-purposed software (the Media Folder case) and getting real material from users, we first decided to devote two months to build prototypes, to test whether certain technology will work for us in the expected way and that there would be no surprises later.

The second prototype (called “tagging proto”) was a raw implementation of W5 described above. Each point has five fields (What, Where, When, Why, Who) capable of containing URL to some web-resource.

Another two prototypes were about Urban Mediator ontologies. The first one was completely theoretical and resulted in the definition of fact representation language. The other one was about utilizing that in a knowledge base and resulted in a Prolog program capable of resolving queries to W5 database. Questions used to populate database were borrowed from the above mentioned workshop materials.

Another prototype was about a special web interface, which made it easier to really add data into W5 data structure.

Building those prototypes helped software designers to “feel” how concrete software solutions will look like thus making sure that the Urban Mediator design is not driven by technology (which is very often the problem of new technologies), but that technology is selected to make desired solution possible. These trials set the ground for strating work on building an actual working prototype of Urban Mediator, which would be addressing the first are of development, mainly in-situ access and contribution to information.

In October 2006, Urban Mediator Stage 1 prototype trials started with four volunteers, residents of Arabianranta, who were asked to act as citizen-reporters. They were given Symbian S 60 mobile phones with Internet access and Bluetooth-enabled GPS receivers. A small mobile application made it possible for them to launch the web browser where a clickable map centered on the spot they were in would appear. They were asked to mark on this map points to which they would link any kind of comments they feel relevant. At that point, the information gathered also contained the geographical coordinates of the location to which they were referring to (via the GPS or the map), the time of creation, and the username freely chosen by the participants. People were told to put into the Urban Mediator everything they think is valuable for other people and city officials to know. As a result of these field trials a collection of 70 points was gathered.

Initial Urban Mediator content and practice descriptions by users allowed to see the design space people would like to deal with. Gathered content provided insights for domain model of the Urban Mediator and description of user activities helped with user interface and interaction styles.

Conclusions And Further Plans

During co-design a dialog should happen between stakeholders. Software and even paper prototypes facilitates this process, because potential users and interested parties can express their idea with the common language of such prototypes. On the other hand, users try (as in case of Urban Mediator) to express their needs by filling system with content. Obvious workarounds are visible to the HCI and software designers as unexpected ways to use the system.

However, user input of all kinds (both in the form of static content, observations of practices, analysis of similar projects and practices behind them) is not to be understood in a literal sense. Many suggestions were analyzed and the planned implementation of new features is not done automatically. We tried to understand if the suggested feature is really a glimpse of some greater need, which can be satisfied in a more general way. Software designers are specialists in building information models of any problem domains and that ability may lead to more streamlined designs. Likewise, HCI specialists possess practical knowledge on

making better interfaces. It means, that feature requests by the user are not handled one by one but as representatives of underlying integral model.

Collaboration with members of the Moderators group, of the residents' and parents' association, and with the Art and Design City company has been relatively successful as the co-design work has helped us advance in developing features for Urban Mediator. Some failed attempts at collaborative work have also brought unexpected results, such as the case of a meeting with schoolteachers, which was supposed to trigger prototype workshops with students but never took off. During the meeting however the important issue of the need for some kind of moderation for the system came up and helped our team better articulate the need for a feature that was then implemented and permits users to flag content as inappropriate.

Our initial plans for co-design also included involving representatives of city authorities in workshops and testing activities, as they had also been recognized as key stakeholders. This however has not been successfully achieved until now. We can speculate that one reason is that Urban Mediator is not being developed as a tailor-made solution for cities, but is rather an open system and tools for a variety of stakeholders, particularly citizens. Because of that, engaging in exploratory workshops or testing prototypes that are very obviously of an unfinished nature can be seen as a waste of time for them. An exception to that is the City Survey department, an official partner in the ICING consortium, with whom we are collaborating in an effort to use the online Helsinki maps for Urban Mediator.

However, the fact that a public trial of Urban Mediator in Arabianranta is planned, and the possible interest from one city administration office to participate in it, might trigger more collaboration for the next phases of Urban Mediator development. Moreover, the fact that we are moving to the development area of tools for encouraging participation might provide us with more concrete collaboration possibilities for us to propose the city administrations.

Once again, engaging stakeholders in a collaborative design process is not easy, particularly when it is not always clear for them how they can benefit from such an effort. It would be important to remember that the design stage that Erickson labels as “design evangelism” – in other words defending the project, and in that case defending the need for co-design with the identified stakeholders – should be addressed early on in the project.

Notes

[1] The focuses of Priority 2.4.9 that ICING addresses are: 1) Innovative ICTs for democratic involvement, in particular eParticipation, 2) Intelligent, inclusive and personalized eGovernment services, 3) Adaptive and proactive eGovernment support systems (Information Society Technologies portal 2004)

[2] The Art and Design Company serves the area of Arabianranta in Helsinki and is owned by the City of Helsinki, Ministry of Trade and Industry, University of Art and Design, University of Helsinki, Arcada Polytechnic, Pop and Jazz conservatory, the Arabianpalvelu (Arabia services) company and the Iittala glass manufacturing company.

[3] A moderator is a resident of a building that voluntarily takes up the job of moderating the buildings web pages. There are 20 residential buildings in Arabianranta that have a moderator moderating their building's own web pages.

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Intermediaries and Social Learning bridging users and producers

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Abstract

Intermediaries between supply and usage of technology are at once obvious and neglected actors. On the one hand various consultants, distributors, government agencies etc. routinely play important roles between technology producers and various end users (Howells, 2006). On the other hand the roles and importance of intermediaries in social learning around the design and uptake of new technology tends to be underestimated by both practitioners and research alike (Stewart, 2007). There is simply more at stake than enabling or preventing the technology from diffusing from suppliers to users. Intermediaries are crucial in organizing user knowledge and experiences, and mediating between emerging users and producers in uncertain markets (Williams et al, 2005; Russell & Williams, 2002; Hyysalo, 2004).

Building on the Social Shaping of Technology approach, we clarify our social learning perspective used in understanding the dynamics of long term development and uptake of new technology (Williams et al, 2005), and explore its relevance to studying intermediation and intermediaries. We then review findings on intermediaries in some of our studies and other available literature. The topics we address include differences between established intermediaries, which are often addressed in management and policy literatures, and emerging intermediaries that are created in parallel to new technologies, markets and uses. We show how they map to the supply - use axis, development paths, and roles they play in mediating design and use. Specific roles that we examine include those of Facilitation, Brokering and Configuration. Equipped with these insights, we explore in more depth how intermediaries affect the shape of new technology, and how the lack of appropriate intermediaries can severely impede successful innovation.

Introduction

Our traditional concept of the role of intermediaries in the economy is to transmit goods and facilitate monetary transactions. Few of us buy software or hardware from the producers but rely on networks of retailers, banking services, transportation agencies and so on. But intermediaries are also involved in what Callon calls an “economy of qualities” by which the needs and desires of consumers are shaped and products adjusted by a range of actors arrayed between suppliers and consumers (Callon et al 2002). Rather than having some primary and secondary characteristics, “the technology” gets constituted by all the actors that are involved in packaging, distributing, assembling, quality assurance, testing, bundling and branding it. Likewise, the “consumer” is constituted by intermediary actors involved in segmenting, persuading, selling, advising, studying and regulating the consumption, and in so doing, creating attachment to consumed items. Together these very tangible networks are able to shape, respond to and maintain seemingly abstract characteristics such as styles and tastes (Callon et al 2002).

However, in this paper we focus on *innovation* intermediaries: actors who create spaces and opportunities for appropriation and generation of technical or cultural products by others. In periods of intense innovation, such intermediaries can be identified by their continual engagement in activities, in which they gather, develop, control and disseminate knowledge, collect and disseminate financial, technical and institutional resources, such as the support of users and sponsors and attempt to regulate uses, developments, participation and the actions of others in the network. The extent to which they do this depends on their access to resources and their connections in the 'constellation' of actors associated with a particular project. While they configure the users, the context, the technology and the 'content', they do not, and cannot define and control use. The service in the innovation constellation they provide is that of a facilitator, they help users to do their own thing, and also allow sponsors and suppliers to fulfil certain of their aims. Nonetheless, in taking on this role they can have important influences on and inputs into innovation.

Research on intermediary organizations in innovation such as consultants and other technology brokers began to grow during the early 1990s (Bessant & Rush, 1995; Hargadon & Sutton, 1997). At the time, models of innovation were rapidly changing from fairly linear ones to ones emphasizing uncertainty and shifting character of effort and the complex interactions between multiple actors that jointly comprised the iterative series of developments jointly resulting in innovation (Freeman, 1979; Kline & Rosenberg, 1986; Edge & Williams, 1996; Van de Ven, 1999). The changes in the models were spurred by increasing flow of findings about user initiated innovation (e.g. von Hippel, 1988; Pavitt, 1994) and the continued innovation in use (e.g. Gardiner & Rothwell, 1985). The then relatively new and rapidly evolving fields of robotics and computerized manufacturing technology showed that talk of diffusion of generic systems matched poorly the extensive adaptations and further developments done by adopter organizations (Fleck, 1988; 1994; Bessant & Rush, 1992). In short, when the producer company lost its position as the privileged source of innovation, it became urgent to understand how the knowledge from a range of actors flowed into the innovation process.

As a consequence, there is a range of studies that document well the various intermediary organizations (various consultancies, state research centres et cetera) and the roles they play in fostering innovation at the development end and in technology procurement (Howells, 2006; Bessant & Rush, 1992; Van der Maulen & Rip, 1998). In fact, these issues have received attention in various literatures, including innovation management (e.g. Hargadon & Sutton, 1997; McEvily & Zaheer, 1999), literature on innovation systems (e.g. Stankiewicz, 1995), and science and technology studies (Proctor & Williams, 1994; Van der Maulen & Rip, 1998; Callon et al 2002). This interest was also spurred by the empirical development where the role of knowledge intensive business services (KIBS) began (and has ever since) grown in many industries (Howells, 2006). Diffusion studies have stressed the importance of change agents and opinion leaders in the diffusion of innovation (Rogers, 1995; Attewell, 1992), and particularly after the late 1980s began to emphasize the work these actors do in tailoring and adjusting the innovation to different audiences and promoting re-inventions that make it more appealing for each particular audience (Rogers, 2003). From a more generic perspective, social network studies have also begun to show the importance of network 'bridgers' in not only transferring knowledge across structural holes in networks, but as important source of innovation themselves (Burt, 2004).

However, to our knowledge there are few studies and frameworks that address in detail the whole range of intermediaries and intermediation that transform technologies, uses and qualities in both using and producing side, and explicate the bridges and gaps that exist in different ecologies of intermediation between design and uses. National innovation systems

literature aims at this (Lundvall, 1994; Stankiewicz, 1995), but only at a fairly coarse granularity. We thus turn to framework of social learning that allows us to explore in more detailed fashion the dynamics through which intermediaries affect ICT innovation in different socio-economic contexts and constellations of actors with different capabilities, commitments, cultures and contexts (Williams et al., 2005). The empirical relevance of this framework lies in that there are high uncertainties and information asymmetries involved in “choosing” or “creating” the right intermediaries for inventive technologies or new groups of users. There is simply more at stake than enabling or preventing the technology from diffusing from suppliers to users. Intermediaries are crucial in organizing user knowledge and experiences, and mediating between emerging users and producers in uncertain markets (Williams et al, 2005; Russell & Williams, 2002; Hyysalo, 2004).

As we shall illustrate in the course of this paper, many of the ICT-innovations we have studied have withered because the assumedly established intermediaries turned out not to be up for the tasks required, be these in distributing, adjusting, configuring, helping to maintain or in gathering feedback to supply side actors. The practitioners and researchers alike are thus in need of more fine grained accounts of how to conceptualize and deal with the set of questions that innovation intermediaries between supply and use pose.

We proceed by first clarifying our social learning perspective and its relation to studying intermediation and intermediaries. We then do a brief review of intermediaries that are typically established in a given industrial sector and map these to supply use axis. We then move to discuss the roles intermediaries play in mediating design and use, and address the questions of how intermediaries emerge, grow and fade. Equipped with these insights, we begin to explore in more depth how intermediaries affect the shape of new technology and turn to more in-depth inquiry in how to manage well established intermediaries and how to nurture ill-established but important ones. As these concerns become particularly acute in relation to small companies and NGOs with innovative new products and services we purposefully take this as our perspective throughout this article.

Social Learning in Innovation

Social learning in Innovation is a concept developed within the tradition of 'social shaping of technology' approach (MacKenzie & Wajcman, 1998; Williams & Edge, 1996), which views development of new technology as an uncertain process, characterized by complexity, contingency and choice (Williams & Edge, 1996). It places particular design episodes within multiple, overlapping cycles of development and implementation (Rip, Misa & Schot 1995), focusing on understanding the coupling between technological and social change, and the difficult and contested processes of learning that are integral to innovation.¹

This analytical framework is socio-technical: it not only attempts to account for technological innovation, also the processes of negotiation and interaction that occur between diverse networks of players attempting to make technologies work - 'fitting them into the pre-existing heterogenous network of machines, systems, routines and culture (Sørensen 1996). Many contemporary technologies, particularly ICTs, are not discrete, but 'configuration', consisting of layers of components, systems, applications and content, bringing with them partially

¹ Social Learning draws additional insights on a range of research fields: cultural studies of artefacts and marketing, engaging with the consumption of goods and services; innovation studies stressing non-linear and heterogeneous innovation processes; and work on organisational learning and the reflexive activities of players in the innovation process.

formed routines, concepts of users and uses, rules for use and other non-technical features. Fitting the existing and the new together involves often long and drawn out relationship building and stop-start processes of institutional learning and forgetting that occur across a constantly changing network of actors.

To understand these processes the Social Learning approach draws together a range of generic mechanisms in which we see learning-through-innovating occurring: learning-by-doing and using in the often trial and error processes of appropriating new technologies (Arrow 1962; Rosenberg, 1982); learning by interacting (Corish, 1997; Lundvall 1988), as new technologies bring diverse networks of players together; and learning by regulating (Sørensen 1996), as particular players attempt to assert their power through non-technical rules and regulations shaping the 'rules of the game' from everyday use to state policy. These processes—and more detailed learning dynamics within them—not only shape technology, but can have a dramatic effect on the structure of the innovating network, the constitution of the organisations involved, and the identities of the actors (Russell & Williams 2002; Hyysalo, 2006; Hasu, 2001). Many of these actors and institutions are end and intermediate users, and other societal actors such governmental and non-commercial institutions. Social learning stresses the importance of giving more detailed accounts of how these actors play key roles in innovation in the long term.

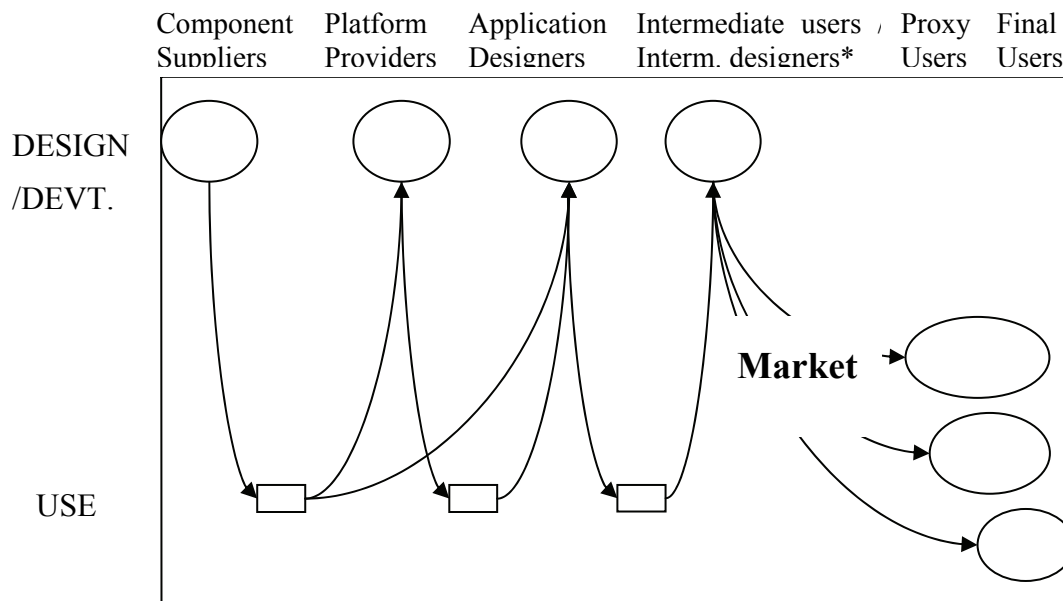
Central to the innovation processes identified in social learning are the creation and evolution of *representations of users and uses*, and their translation into technological designs and social actions. These processes are fundamental in shaping design and relationships in the constellation of actors. Far from being solely an up-front 'user needs and requirements capture' process conducted by designers, creation of these representations involves all the participants, and continues through-out a project, and over generations of product development. Many different users: intermediary users, end users and proxy users can play more or less active roles in articulating their own requirements, and in the creative process. The ability and willingness engage with users and for users to engage creatively with developers is thus central to success.

This conceptualisation of the role of users in the innovation processes, involves moving the focus of innovation studies from the supply-side towards the demand side so we need to account more carefully for the appropriation and consumption activities of users. In particular we need to examine how constellations of users developing uses for technologies and their role in feeding back user experience, practice and innovation to the supply side over multiple long-term innovation cycles.

Innovation contexts

In this paper we are exploring the role of intermediaries in innovation, but within the context of different innovation spaces in which the actors are given different degrees of freedom to exercise choice, or act reflexively (Bessant 1991). In particular we are concerned with the involvement of users in the innovation process, and the type of influence users have in the innovation processes. At one extreme, users are considered as 'passive' with no choice over adoption: a technology is imposed; this is the much criticised 'linear model' that emphasises planned impacts of innovation on users, and neglects the dynamics interactive aspects of innovation that have been broadly documented. Each member of a supply chain can thus be regarded as an intermediary between the preceding and following player, and end users only have contact with the final player in the chain.

Fig 1. Pipeline linear development and diffusion

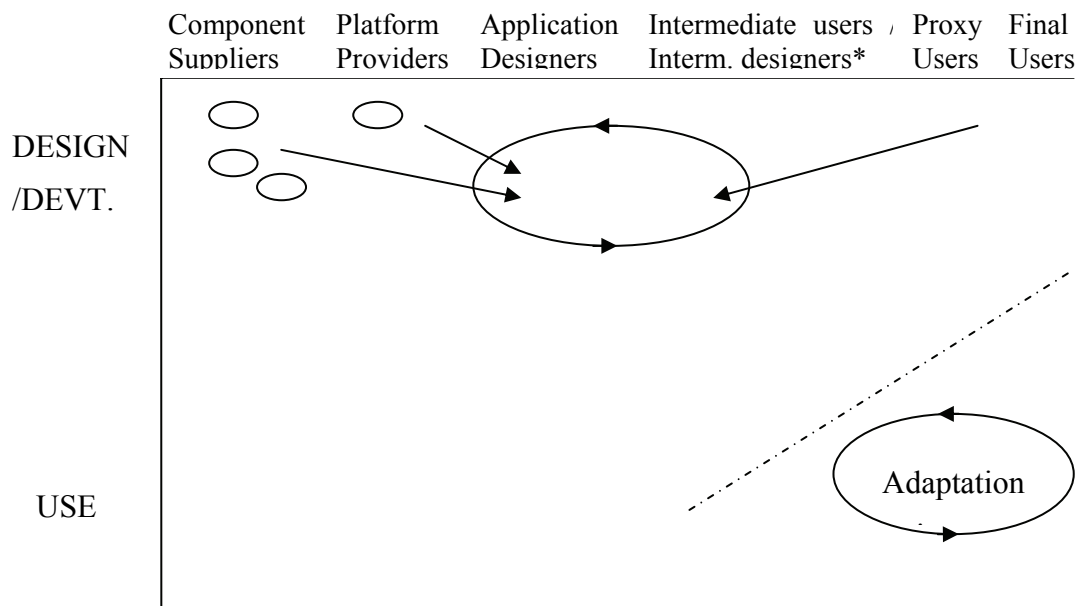


* Intermediate users are organizations that adopt a technology for their customers or employees. Examples are mobile phone operators, banks, retailers who sell to end users or firms, and any firm adopting a system to be used by their employees. A subset of these are 'content developers' or content service providers. E.g. a service provider offers both a delivery platform and content for end users. These organisations can be seen as supply-side or demand side according to the particular case and particular point in the innovation and implementation process.

An alternative to this model proposes users as consumers of pre-formed technologies, where their only choice is between use and non-use of a technology: suppliers and end users are separated and user preferences are signalled at arms length through a market. This allows for user preferences and innovations to be returned to suppliers though market signals, although these may not be very clear, and certainly not to the whole market, and invisible to firms deep in the supply network.

In contrast to this relative non-involvement of users there are innovation contexts where user-centred design processes—in which end-users, or more correctly 'proxy users'—are put at the centre of design. Detailed studies of users, along with negotiations with proxy or intermediate users of their 'needs and requirements' supposedly allow those creating new technologies or integrating systems to create products and services that closely match the existing culture and activities of specific users (e.g. Norman and Draper 1986). However, as with the previous models, this approach prioritises prior design work and neglects the activities of a range of users in actually getting the 'finished' product to work (Stewart & Williams 2005). It also neglects the processes of 'generification' that usually proceeds specific design, as developers try to remove all specific user features to create a generic product suitable for larger markets.

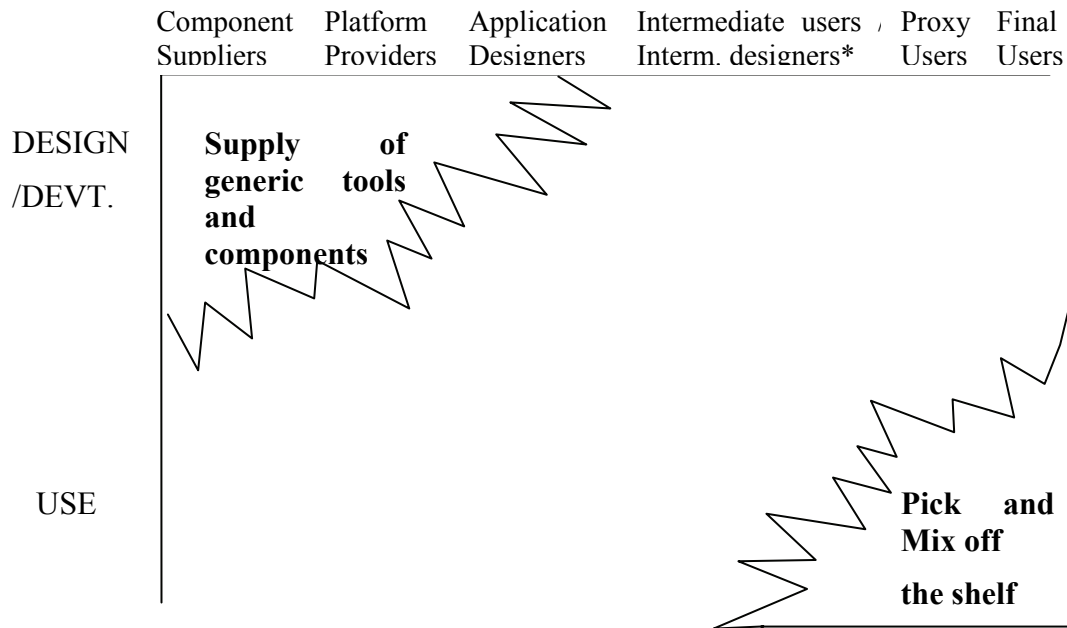
Fig 2. User centred design. A more dedicated application is built with the help of proxy users



Though a range of case studies done as part of the European *Social learning in Multimedia* project in the late 1990s, Williams et al (2005) identify three other modes of user involvement in innovation: the technology experiment; the appropriation model, and an evolutionary model ‘pick and mix’ model.

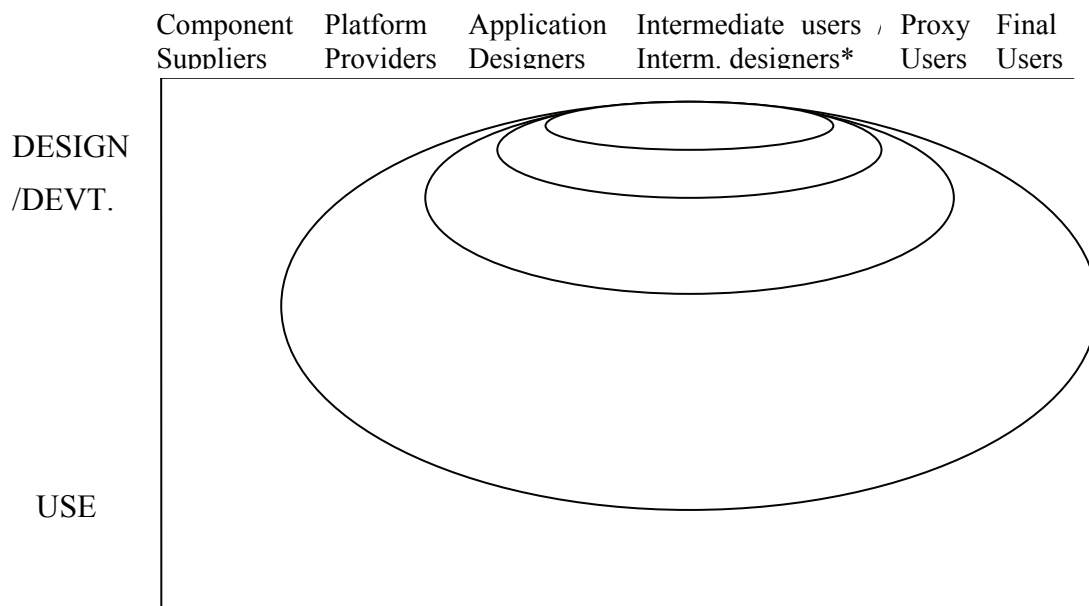
The ‘pick and mix’ model is closest to the market model, where intermediate and end users are able to pick from a huge range of available generic technologies, and configure them together. This model is characteristic of the current ICT market, where intense competition, flexible standard platforms such as common operating systems and internet protocols, and open programming interfaces and tools make it relatively easy, and very cheap to configure. Here we see the emergence of a range of intermediaries that configure technologies and uses, attempting to bridge the ‘market gap’ from suppliers to user and visa versa.

Fig 2. Pick'n Mix model where there are large clusters of generic offers at the supply end and the configuration of off-the-shelf components at local user sites.



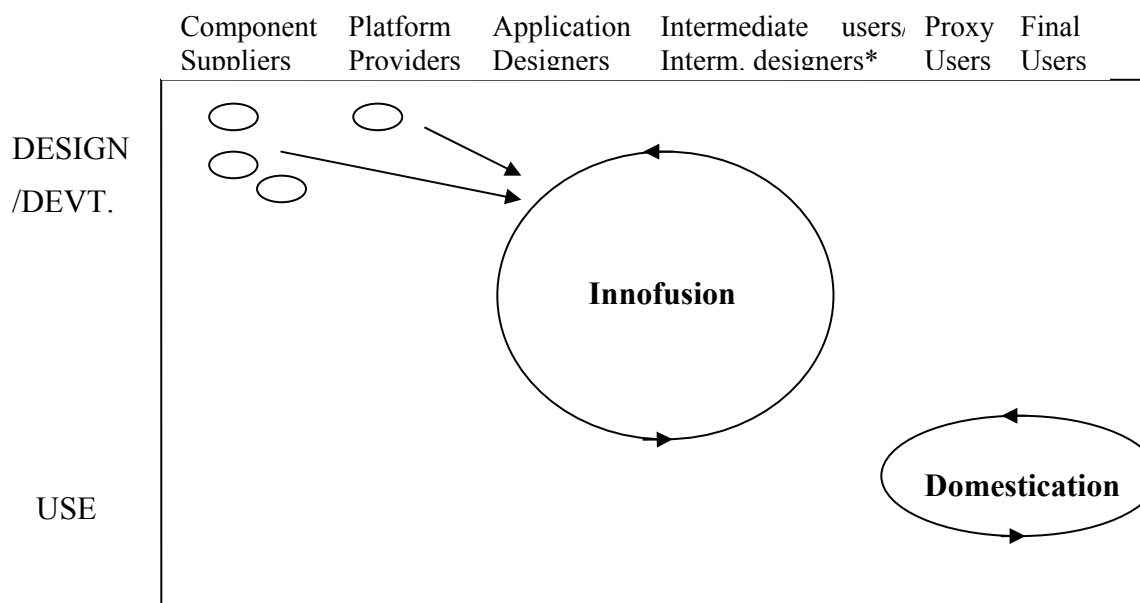
The Technology Experiment is mode of collaborative innovation that involves a range of players, such as government agencies, intermediate users, developers and suppliers (Jaeger *et al* 2000). This can often be the result of certain key players deliberately constructing a constituency of actors that provide a framework of ideas and resources to shape innovation (Molina 1995). Such process can be based on co-design between designers and users, comprise an open-source type development or at least eventually involve users fruitfully (Hyysalo & Lehenkari 2003). However, it can also merely verify the chosen technology model negotiated early on in the process. This partly depends on the degree to which core players are open to innovation by users, and the points at which configurations are locked into place (Van Leishout *et al* 2002).

Fig 4. Technology experiment / evolving co-design project



Finally, the appropriation or SLIM model draws on two concepts: domestication and innofusion to highlight the work done on the 'demand' or user side. The 'domestication' concept (Lie and Sørensen 1996) captures the practical, symbolic and cognitive dimensions in the selection, deployment and adaption of new technologies. The innofusion concept highlights the technological innovation done in these processes, emphasizing that key innovation moments occur in and are controlled by the user environment. The interactions between networks of users and designers are not continuous or controlled, but are constantly changing, as different sets of actors in the constellation of interested parties are temporarily linked.

Fig. 5 Innofusion and domestication model



Innovation is seldom confined to one of these modes, but over time a particular project, technology or constituency will move between them. As this occurs the roles of particular actors can change, and it is clear that a simple dichotomous division between users and designers does not hold up. There are a range of roles of both supply and user side. What is striking though is the important role of intermediaries in all of these modes of innovation, but also the immense variation in types of intermediary.

Mapping intermediaries between supply and use

Between developers of technologies and their eventual users there appear to be a huge range of intermediate institutions through which money and information flow, and who play key roles in configuring and integrating technologies, and building representations of users, uses and markets, bridging the gulf between suppliers and users. Some such actors are retailers, media companies, telecoms platform operators, venture capitalists, lawyers, advertising agencies, trade associations, promotional agencies, export agencies and market research agencies, distributors, standards agencies, regulatory agencies and management consultancies.

While such an impressive list of intermediaries can be found in almost every branch of industry, the established intermediaries can turn out to be inadequate for doing the kind of job supplier and prospective users need. Let us briefly illustrate this by two examples from our studies.

The first example is in the area of video games for girls and women. The established industry of games publishers and events, magazines aimed at existing market for these products is almost whole devoted to promoting particular range of game genres to a young male market. For a firm who identifies a market for 'girl games' and is able to engage with potential users in the design of attractive products, these intermediaries are not a resource but a hindrance, and necessitate recasting the products and making new connections to non-traditional intermediaries - such as general retailers, museums and TV broadcasters. And also in real life such shift proved necessary for success (Stewart, 2004)

Another example comes from diagnostic equipment for medical laboratories. A line of innovation for handling radio-active samples came to dominate its niche market in late 1970s. However, when the concept was further developed for general laboratory use, the few established large companies dominating the diagnostic market showed no interest. The new technology would have meant shifting from large centralized batch processing to small distributed sample handling. Moreover, as the new system would use only a fraction of reagents in comparison to established open vessel chemistry. As the reagents were the most profitable business for the incumbent companies and laboratory experts had their training in open vessel chemistry, the new concept gestated for over twenty years in various efforts to bypass the regime that governs the venture finance and distribution channels between development and end users (Höyssä et al, unpublished manuscript).

While established intermediary institutions provide an important stable framework for potential suppliers and users of new technologies, for example, in which to innovate, comply with and influence regulation, raise finance, to bring products to market, to assess and compare new offerings etc, they can also be roadblocks, and expensive and intransigent gatekeepers, with services, repertoires of knowledge and activities, that can *fail* the innovation process in a range of ways.

These observations are consistent with other research on intermediaries. Howells (2006) describes the range of different players that mediate various aspects of innovation. Bessant and Rush (1992) go further by elaborating how the range of consultants between suppliers and users of automated manufacturing technology (AMT) each had somewhat different competencies, motives, pricing, clientele and the niche that they occupied in this innovation context. None covered the range and depth of functions that met the needs in emerging areas of innovation. In similar fashion, Hargadon and Sutton (1999) show how the knowledge brokering role and industry position of design consultancy IDEO changed as it accumulated more know-how about different industries.

Before moving deeper into the intricacies in the positioning of various intermediaries, let us tentatively sketch some typical intermediaries and their position between supply and use.

Fig. 6. The niches of some common types of intermediaries illustrated in pick ‘n mix constellation (discussed below).

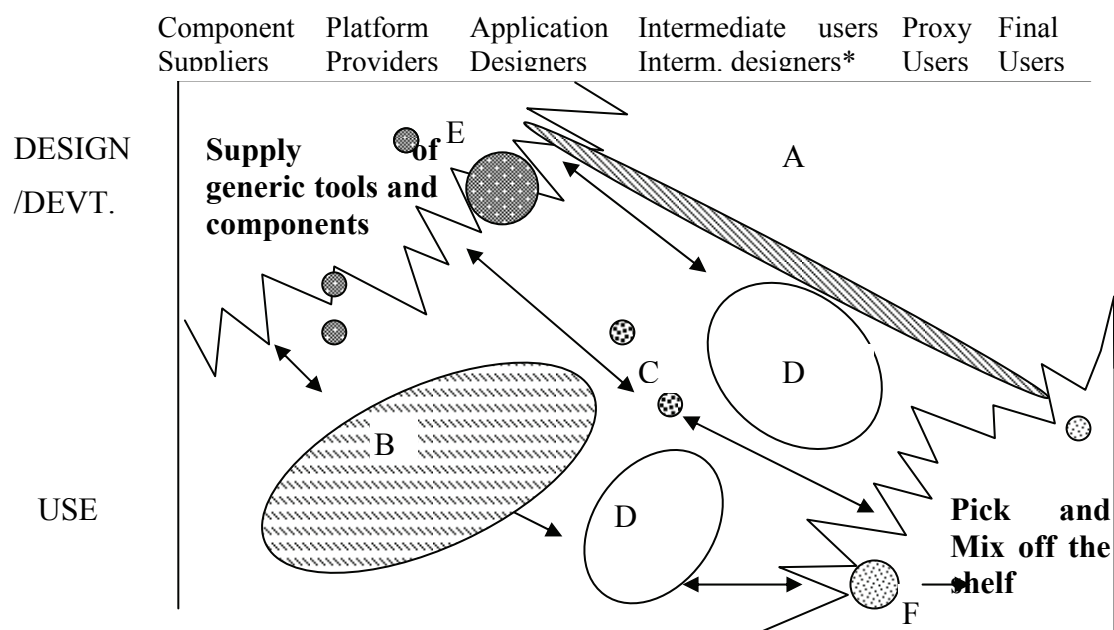


Figure 6 illustrates the differences in profiles and in consequent mediating capacity of intermediaries. Some intermediaries, such as maintenance technicians, have long “reach” between supply and use but may be fairly limited in terms of content it covers. (In the graph marked by A). As we found in our study of a health monitoring technology “Wristcare” for the elderly (Hyysalo, 2004), technicians can have direct contacts with developers, intermediate users, other supplier representatives as well as end users, but their mandate, interest and expertise remains limited to reporting and fixing technical shortcomings and technical assembly, thus leaving aside questions of marketing, instructing, learning, new uses et cetera. The “width” of their mediation thus tends to remain narrow, unless their task description gets expanded to include other tasks, such as user-training as happened at one point in the case studied (Hyysalo, 2006).

An example of a broad width but substantially shorter reach into both using and supply side would be retailers (in the figure marked by D) and Telecoms operators (in the figure marked by B). Such actors exercise competence and power over multiple technologies and several key aspects of technology such as pricing, distribution channels, marketing, branding, feedback from other intermediaries and end users et cetera. Yet another sort of intermediaries

are market research and usability consultants (In the figure marked by C), that accumulate, refine and transfer (second order) information both about products as well as of their usages. The most studied type of intermediaries are various supply-side industry consultants (In the figure marked by E), who may play central roles in augmenting innovation at supply end and passing inter-industry insight but which do not extend their actions beyond the supply end towards to users and markets. These include engineering and business consultancies, universities and public research agencies, industry contractors, accreditation agencies et cetera. (e.g. Howells, 2006; Bessant & Rush, 1995, Van der Maulen & Rip, 1998). Nonetheless, we find that these business consultancies have an increasing role working for firms and government as intermediaries facing the supply network.

Intermediaries at the supply end business to business environment tend to be more numerous, visible and formal than particularly those close to the end-users of consumer goods. Moreover, amongst the use-side intermediaries (marked by F in the figure) those involved in buying and the paying for new technology are relatively more visible than those that help people use, fix, maintain and update their technologies. The latter are often less formal and may perform their work as peer favors or sidejobs to their formal work. As a consequence, it is particularly these intermediaries that tend to be systematically neglected or underestimated. It is indicative that discussions of such peoples as 'local experts' (Stewart, 2007), 'technology mediators' (Okamura et al. 1994) or 'tailors' (Trigg & Bodger, 1994) remain absent from technology management volumes that abound with literature on product champions, business angels etc. at the supply end. Below we shall discuss in more depth the roles that Cybercafe managers played in facilitating the adoption of ICTs at the time when internet was relatively new during the mid-1990s.

The asymmetric distribution of knowledge amongst actors results in that people and organizations that hold intermediary positions tend to accumulate increasing amounts of the kind of knowledge that flows in from their various clients and projects, whereas other actors do not. The net result is that less central actors (such as new supplier entrants, end users) face difficulty in assessing the landscape, position of different actors within it as well as the means at the disposal of those actors to hinder or enable the prospering of new technology. In fact, such structural holes and knowledge asymmetries are crucial in the existence of the very niche of many actors, and we return to discuss this theme in more depth below (Burt 2004).

In the health monitoring and alarm case, the entrant firm having its roots in supply side networks had recurring difficulties assessing the competence and findings from industrial designers, advertisement agencies, and market research agencies they exchanged knowledge with (some of which is documented in Hyysalo, 2003). Likewise, the users of this application had little insight how to contact or deal with vendors or the supplier during the early use even when there was mutually beneficial reasons to do so in for instance troubleshooting the system (Hyysalo, 2004; Hyysalo, 2006).

It appears to be very common for intermediaries in the appropriation stage tend to do much, even all of their social learning-related tasks alongside or informally along their formal job description. Intermediator roles thus hinge upon corporate policies and reward structures that have a bearing upon what roles people in the interface can take on in regard to social learning. For instance, sales teams are often expected to be gain valuable information from customer preferences and cultures. But sales people mostly talk with purchase people, and not with end users. Moreover, sales people are seldom granted enough freedom to convey such information onwards in supplier organization in a manner that would really have an effect on its product development. Also the incentives for doing so tend to be lacking: sales teams are rewarded on the basis of the deals they close, not on the potentially helpful

information they may glean from customers. Reward structures that would encourage side bets relevant to social learning, may also prove rather difficult to set in place without undermining the effectiveness of sales-based structures. This tangle gets more tricky when the sales are handled by an intermediary organization rather than the supplier itself: getting telecentres sales staff to sell a conceptually new product is one thing, getting them to do that in a desired manner is another. Further challenges arise once one is to have them use the right arguments, have adequate understanding of the product, target preferred customer segments etc, and getting them to transfer more needy customers to supplier's people who have more expertise, or how to get them to glean and pass on information about customers. After relying for three years upon a chain of intermediaries for feedback on how their technology did the president of the health monitoring company noted:

"Since [our new customer support and maintenance person] started, it has turned out that our retailers, partners, and assemblers haven't really provided us with information about how the device works in actual use. Neither do they know how the device should function... Here is the one employment that has most effectively paid for itself" (Interview with the company founder 17.9.2001)

This quote also illuminates another issue: there tends to be personification of intermediary position and if the benefits or appeal of intermediating some line of technology wane, these people are likely to shift location. The person talked about in the quote had held a range of similar roles in maintenance, training and marketing in several other companies in safety-phone business for over ten years, and came to this start-up after his position waned in his previous employment. Such circulation within limited space is common in ICT business, leading to acquiring increasing expertise and knowledge about the domain specific roles (inside a supplier organization, promotional agency, sales of other company, procurer in a user side organization).

What do intermediaries do in social learning?

Perhaps the clearest way to approach the range of activities in which intermediaries are involved is to first look at some taxonomies that exist in the literature (Howells, 2006; Hardagon & Sutton, 1997; Bessant & Rush, 1992). Howell suggest 10 functions for innovation intermediaries, even though he admits that individual intermediaries seldom play separate functional roles, but contribute and develop a range of different activities important in innovation. Intermediaries are heterogenous and not only discrete organisational entities, but may cross organisational boundaries. In similar vein Bessant and Rush (1995) list six bridging activities through which consultants bridge between the supply side and their customers. These activities follow not just by working on one off projects, but also by developing long term capabilities of the individual firms, and of the market as a whole as they work not only on a triad basis but are generally involved in several relationships.

Table 1 Functions and Activities of Intermediaries

Intermediary functions (Howells, 2006)	Bridging activities (Bessant & Rush, 1995)
1. Foresight and diagnostics	1.articulation of needs, selection of options
2. Scanning and information processing	2.identification of needs, selection training
3. Knowledge processing and (re)combination	3.creation of business cases
4. Gatekeeping and brokering	4.communications, development
5. Testing and validation	5. education, links to external info
6. Accreditation	6. project management, managing external resources, organizational development
7. Validation and regulation	
8. Protecting the results	
9. Commercialisation	
10. Evaluation of outcomes	

These typologies of functions and activities of intermediaries approximate the generic terrain of intermediaries in social learning. However, as Bessant and Rush point out, there is work to be done in charting the roles that intermediaries do within these functions and activities—moreover, as they play roughly the same roles in many of the above noted functions and activities.² All these intermediary roles are about knowledge creation, translation and dissemination. They are all also about making a connection between memory and experience future visions and instantiating these two in current actions of the peoples who’s actions are mediated by them. Should one try to differentiate fundamentally different facets in the actions of intermediaries three distinct roles in social learning become salient: Facilitating, Configuring, Brokering. These more generic roles are better applicable to the range of intermediaries there is in social learning processes between supply and use. We anchor our discussion at the intermediary roles that cybercafés played in the mid 1990s when the Internet was relatively new (Stewart 2000)³.

Facilitating

Facilitating can be described as providing opportunities to others, by educating, gathering and distributing resources, and influencing regulations and setting local rules to facilitate the activities, and goal fulfilment of others. Facilitation is ‘creating spaces’ of various types: social (communities, networks), knowledge (skills, and know-how resources), cultural

² Bessant & Rush (1995) also indicate some this by noting four generic roles, those of transfer of knowledge, sharing knowledge across user community, acting as brokering to a range of suppliers, diagnostic/innovation role in trying to identify what end users actually want.

³ Cybercafe and internet centre innovators took computers and the internet out of offices and homes, and put them into a new context, introducing them to new users and providing a new setting for existing users. What was considered at the time a fleeting and unimportant configuration of the technology involved considerable local innovation, and has since become an extremely popular and successful service model.

(positive images), physical (a place or equipment), economic (providing funds), and regulatory (creating rules to guide activities and reduce uncertainty). In the case of cybercafe managers as facilitators is very clear. Rather than imposing and controlling uses, they 'create spaces' for other people, in this case predominantly customers, to do their own thing. The cafe is a convenient and open, friendly physical space, conveniently located, with an informal atmosphere, which the managers had developed based on their initial concept of users and uses. They provide the computers and software, and the training and advice that is needed to use it. The expertise and knowledge that they supply to the users is as important as the actual technology. They take the headache out of computer use, and create a flexible environment where people can work, play or learn at their own discretion. Training and informal support, and the creation of an atmosphere that encourages interchange between users are important facilitation devices. Of course the cybercafe is a literal space, but we have seen a huge growth in industry-user fora, user and industry networking groups, conferences and seminar series, various government and private funds for experimentation and interaction, and creation of regulatory spaces providing temporary protection from regulations and rules usually applied in a particular environment. As well as bringing together actors in these open spaces, another important facilitation role is running trials that generate new interactions between users and suppliers, and importantly, make the activities and result visible in wider to outside actors.

Configuring

The creation of the space that facilitates appropriation by others and the influencing the perceptions and goals of sponsors and users involves active process of configuration. This includes configuring technology, often in a minor way; creating and configuring content; setting rules and regulations, prioritising uses, the goals and form of projects, and the goals and expectations of other members of the network. Configuration involves education and training of users in skills and uses, but also educating and informing sponsors and suppliers in the activities and requirements of (potential) users. Configuration is not only technical, but symbolic: intermediaries provide an interpretation of the product, the meanings that people give to, say, a technology, as well as real hardware and software, but they also listen to users and attempt to modify the project to reflect those meanings. Central to configuration process is the intermediary creating images and meanings of technology and users that guide their configuration activities.

The managers and owners of the cybercafes in the cases did not invent the cybercafe - computers in cafes were not a new idea. However they had to make decisions about what a cybercafe was, what was relevant to them and their business, and to their customers. This business model led to the configuration of the space, rules of use, configuration of computers, and policy on what users to encourage or discourage. This included the appropriate types of uses: games, the Internet, office service etc, for their café and clientele (Laegran & Stewart 2003). However this was not necessarily a one-off configuration: It changed rapidly as customers introduced their own ideas of what a cybercafe should be, bring it in from outside, and evolving it from within. Some cafe managers really took on board the need for constant reconfiguration and experimentation while others evolved a much more stable model, with little space for user-led change. The cafes also attempt to configure their customers' usage of the cafe through information, training, and informal learning, and introduce new users, for example by running classes for women or older people. By encouraging new uses and new users, they are, of course, encouraging people to spend more time in the cafe, but also making sure that they can appeal to more people, and help customers diversify their use.

The important dimensions of configuring that intermediaries involve shaping technologies, creating visions and models of future uses, of potential users, and helping to make this a reality through various techniques, such as setting rules. Of course in order to do this they have to gain legitimacy, but this can be self-fulfilling if their configuration activities are successful.

Brokering

The third activity of intermediaries in social learning processes is brokering. For example, intermediaries act to raise support for the appropriation process from sponsors and suppliers. They set themselves up to represent appropriating individuals and institutions, and negotiate on their behalf. Intermediaries need to broker entry of new sponsors or suppliers into their project in order to defend the space they have helped create, and make sure that they increase their access to resources and knowledge and can maintain influence over rules and practices. Some of the brokering activities can be around the features and functionalities of new technologies, directly communicating needs and requirements of users and the possibilities and conditions of change of the suppliers.

In the cybercafes case, the manager of one community cybercafe had a strong role as a broker. The cafe came about as a result of his relationship with the funding council, the local community groups, sponsoring companies, and local and national politicians. The project was rather outside the mainstream community project, and certainly not a business he could get a bank loan for, so his negotiation with sponsors, as suppliers of equipment, money, prestige was the only way to make it happen.

Brokering is certainly one of the most direct ways that intermediaries can bring users and suppliers together, but as this example shows it is equally important in bringing other important actors into the local innovation network, and maintaining their commitment and interest, while at the same time communicating the importance of the particular innovative process to their interests. One of the key balancing acts they have to manage is maintaining the openness of their facilitation activities in the face of the brokering activities.

In the case of the cybercafes one set of intermediaries, the managers, were involved in all three processes, and similar functions, such as training, played a role in them all. While many intermediaries may focus on type of activity, particularly in stable environments, the dynamic and unpredictable nature of innovation can lead them to conduct all three. Intermediaries that are likely to be most successful can enter into and balance different activities without constraining the innovative activities of their clients, be they adopters or suppliers.

However we need to consider in more detail the activities and role of intermediaries in innovation processes, in particular their role in multilevel and multi-generation innovation processes.

Intermediaries shaping technology

A two way protection

Taken together the roles that intermediaries play create a more or less protected space to accommodate the new. Primary supply organizations tend to try to push the technology down the throats of users as such, even if users want it in somewhat different form. Intermediaries are needed to smooth its way to users and to pass the message back to developers about the realities of usages. In close affinity, users tend try to make technology do exactly what they

would like it to do while the technology in most cases requires adjusted styles of manipulating and slightly different goals. Intermediaries provide users with freedom to do things they want to do, but at the same time encourage them to set more realistic goals that the technology can actually meet. In doing this two way translation work, intermediaries are trying to work out what the more adequate message and “vision” about the technology could be. While this may bring designers, technology and users closer to being aligned, alignment maybe a too strong of a word to describe what they do. The nature of their actions rather resembles a patchwork of making a working and acceptable configurations between supply and use.

Pre-domesticating and pre-framing of technology

Intermediaries influence technology also in more direct ways. In the 'topmost layer' of technological configuration the role of user side intermediaries is evident. When 'local experts' and 'tailors' help end users choose, purchase, assemble, configure and maintain systems, they prefer certain options and suppress others in their effort to cater a system that is practically useful and usable for the particular user or organization. In turn, this work tends to rely on other intermediaries, such as specialist magazines, web-pages, offers of operators et cetera and eventually translates also into supplier offerings.

In so doing, intermediaries are engaged in “pre-domestication”—influencing what would be an appropriate target for the ongoing development of technology, what could be appropriate goals and motives for using it, and making technology appropriable in their practice. However, saying that intermediaries create of 'alignment' maybe too a strong metaphor here, for the work of intermediation resembles rather a patchwork in making a configurations spanning supply and use to work.

An important part of this work is enrolling other players in the creation of more valuable technological offer for end-customers through adding their products and services to it. While flagging the importance of such enriching and shaping of the technological offer, also power and influence issues need to be recognized. Enrolling other players means selling the technology to them. Distributors, operators etc. have their own perception of user needs, and have different interests and incentives than the supplier or end users in promoting some products and not others, in pricing, in branding, and in aligning products. The technology thus gets framed for intermediary audiences in addition to its assumed final consumers. The product, especially widely distributed content products like games or books, has to be first sold to intermediaries such as a distributor to ever reach the final consumer.

Such framing is not limited to mere sales arguments or other 'wrapping' but tends to cut into features, functionalities and look of the product. For instance, in games development small companies view the distributors as their primary customers, and anticipate their selection processes along (or even rather) than that of end-gamers. The assumed norms and extrapolations over previous behaviour of key institutionalized intermediaries thus channel design already before it ever reaches them directly.

Contested framings: the 'user' and 'technology' as currency

The above dynamics get more complex through the uncertainty regarding markets and users' preferences for new technology prior to its actual usage (Hyysalo, 2003; Williams et al, 2005). The need for or effects of different framings of technology are not readily visible at the outset to any of the parties. Images of users and customers become 'currency' that is proffered and sold to establish and contest business cases. Indeed, the ability of

intermediaries to cut the cake is dependent on how convincingly they can argue their importance and hence, their vision of the user and the buyer. This is not unlike the way intermediaries offer assembly and maintenance services that convince users of images of a technology that is too cumbersome or impossible for users to handle themselves.

It is common to use newspaper headings and consultancy reports as “external” legitimizing devices for arguing the case for one’s own technology and vision about the own and user domain development, as well as doing one’s best to influence them. However, because these images circle and contest one another, “real user data” such as that from usability studies tends to be “hard currency” (Nicoll, 2000) in comparison to market studies and other inferred proxies. Various trials, pilots and demonstrations become instrumental for different parties arguing their case and relevance.

Trials have strong rhetorical value. However, even as such their results remain open to interpretation. If social, economic and cultural environment, visions, intermediaries and structures emerge, failing technology tends to be seen as “prototype” and investment continues to be made to 'realize' it. If some of these aspects do not fall into place, there is less patience and anticipation, problems are more easily regarded as serious, and any problems in a trial get more easily seen as definite one about the feasibility or technical limitations of the project. Moreover, different stakeholders tend to interpret the trial outcomes differently from their own perspective, this leads to what can be characterized as a multilevel game within an ecology of social learning.

Ecology of social learning is a multilevel and multiparty game

As in most social learning, trials and other typical intermediary activities involve a multilevel game. Component providers, applications developers, delivery systems providers, distributors, operators etc. can (and tend to have) different interests, incentives as well as practices in how they capture, store, translate and distribute information about product, users or the supplier. Such an ecology of social learning can be aptly illustrated by the criteria for attributing success or failure by different stakeholders related to a particular "application". Here we can draw on the ‘Wristcare’ patient monitor product (Hyysalo, 2004).

What follows is that for a provider of a particular sensor, such as the Wristcare movement sensors based on particular film, a trial showing consistent and reliable measurement can be claimed success validating its own product regardless of whether the producer of Wristcare could use the same measurements to argue the validity of its measurement to medical community. The component producer would thus be unlikely to engage in further development or R&D unless the Wristcare producer managed to trouble them somehow or portray some very lucrative deliveries looming in exchange for further development. The net effect of these varying criteria is that there are several 'versions' of the seemingly same technology, which differ in terms to what material features are regarded as being part of it (as well as being core / peripheral to it) and what uses, problems, social implications etc. are seen to comprise the technology, what constitutes 'working' and 'feasible' technology etc. (Hyysalo, 2007). As a consequence, the very same trial, experience, or need for what 'user information' is needed presents it self quite differently to different stakeholders in innovation process, and emphasizes the acts in facilitating, configuring and brokering that different intermediaries do during the innovation process.

Conclusions

In conclusion, we wish to focus attention on the role and functions of intermediaries in the innovation process, and not just in the general operation of the economy. Within the context of the user-designer relationship analysis in the design literature, and supply-side –demand side approach in innovation studies we highlight the importance of new intermediaries that emerge to bridge gaps in newly forming networks, facilitate contacts and experimentations by passing knowledge, acting as a store for collective memory, and through their own innovative practices of configuration of technologies, visions, knowledge and relationships. These activities are central to the social learning that occurs in innovation: the processes of creating new relationships and knowledge that accompanies the creation of new technologies.

We have identified three core activities of intermediaries: facilitating, configuring and brokering, and examined some of the detailed interactions and influences that they have in multilevel innovation processes, there is still considerable work to be done in understanding how intermediaries work, who they can be managed, and how they can be prevented from failing. Existing case studies as well as new work can be used as core material: in writing this paper and re-examining existing cases intermediaries appear in many places, and can be seen to play key roles in determining their outcome.

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Mobile Television: Is It Just A Hype Or A Real Consumer Need?

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Abstract

Mobile media are not a new phenomenon. In the media history consumers always searched for the possibility to kill time while they are mobile and certain products and devices were used for this purpose (printed media, portable radio, MP3, game consoles, etc.). But in the case of television mobility is not usual at all. Due to the technological deployment television services offered on mobile phones are already available, but the market potential is uncertain. There are different technologies and mobile operators try to find the business models that best fit these technologies. The supply chain of mobile television involves market players of different markets (e.g. content production, broadcasting, mobile market). The way and level of vertical integration depends on the ability of these companies to exploit their core competences.

The real question is if the consumers really need mobile television services or it is only just a new revenue-generating service pushed by the operators. Several findings of the pilot projects are available and there are some really surprising results. The main aim of the paper is to give an overview about the potential market demand for mobile television services. Even it is a new service, some speculative predictions can be made based on the current media consumption patterns. Although the business models and the technological background are also crucial, the real question is who, when, and where will watch television on mobile devices and which genres/programs will be the most popular.

Keywords: mobile television, media consumption, business model

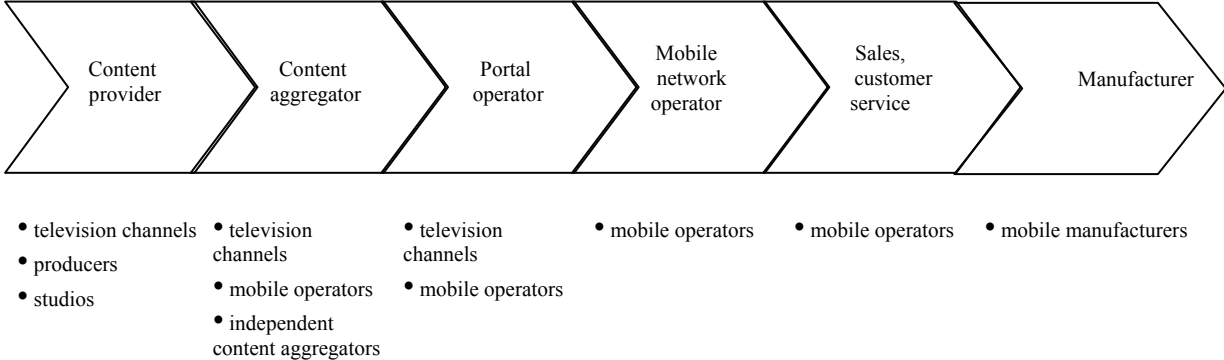
Consumers often expect a kind of mobility from the media products: newspapers and other printed media are evidently suitable for mobile usage, but the portability is also a characteristic of radios and other electronic equipments. In the case of television this feature is not so evident. Until the last years mobile television was only a dream of heavy-user television fans, but it seemed to be unfeasible. With the diffusion of third generation mobile services (e.g. UMTS) and with the introduction of mobile broadcasting technologies the mobile television is not a futuristic vision any more.

1. Business models and pricing strategies

Mobile television services can be offered by different technologies. The first mobile television services were introduced on the 3G systems, the bandwidth is high enough even for video content. Based on a unicast technology it is a highly personalized service, the subscriber can

watch any kind of content at any time, but the prices are high. This kind of point-to-point communication form is costly, since sometimes the same content is sent to many phones in the very same cell. Economies of scale cannot be realized in this case, and capacity planning is problematic.

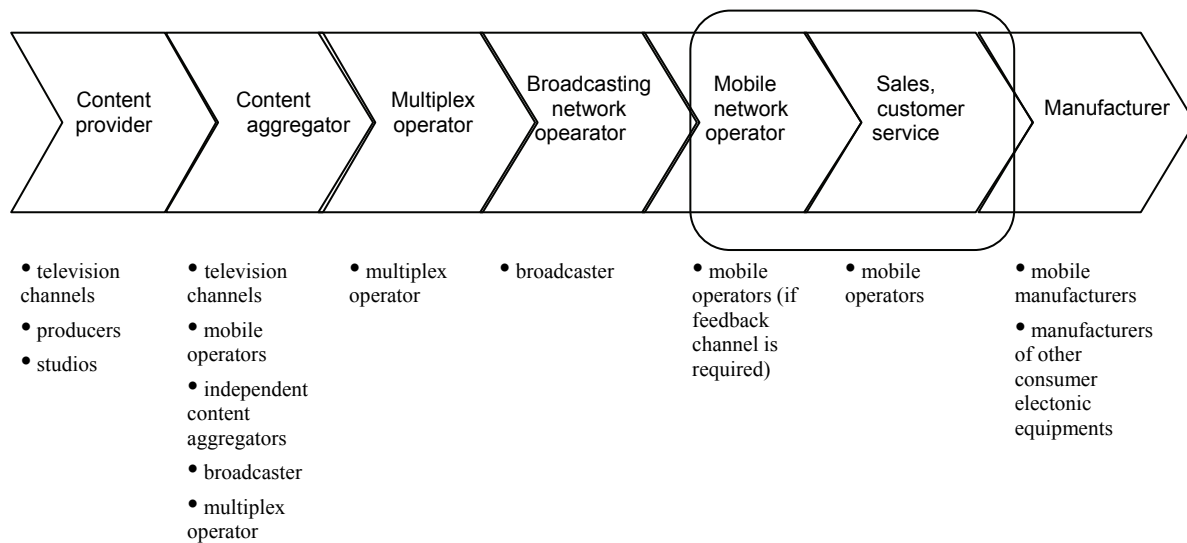
Fig.1: Supply chain of mobile television services offered on mobile networks



Mobile operators have a key role on this platform, even if they do not have any core competence on content providing. The network operator and the sales/customers service functions are crucial, and the mobile operators cannot be substituted. They use the frequencies and they have direct relationship with the consumers that is required for handling the billing system. They can also operate the portal (an example for that is Vodafone Live! content portal operated by the Vodafone). In this model the mobile operator has the best chance to get the central role of supply chain, the level of vertical integration depends on its market power and corporate strategy.

In the case of mobile services offered on broadcasting networks the situation is different. There are several technologies based on terrestrial and satellite distribution (like DVB-H, T-DMB, S-DMB, MediaFLO, ISDB-T) but there is no single global or at least European standard. Role of mobile operator is not so evident, since the mobile network itself is not required for the core service and the sales and billing functions can be also unnecessary if the business model is built on free-to-air (FTA) services. It is not clear which player of the supply chain can have a key role on the market in this case.

Fig. 2: Supply chain of mobile television services offered on broadcasting networks (DVB-H)
in the case of paid services



This technology is relatively new, the potential business models are uncertain. The *content provider centric business model* exploits the competition for the valuable rights based on the 'content is king' concept. For the content provider the lack of customer service and billing system can cause difficulties.

In the *content aggregator centric business model* the content aggregator probably integrates the content provider but the lack of direct customer relationship can be problematic here, too. If the operator of an other platform (e.g. a cable operator) enters into mobile business and takes some content aggregation function, the billing problem can be somehow solved.

The *multiplex operator centric business model* is maybe the most uncertain now, since the whole long-term future of the digital television market is not foreseen. In the so-called strong multiplex model (where the multiplex operator and not the regulator decides about the available content and the packaging of channels) role of the multiplex operator can be crucial. It can also build out customer relationship system.

A *network operator centric business model* is also possible. It can be the broadcasting company that operates the terrestrial network, but it does not have customer service. Due to the experiences of digital terrestrial television (DVB-T) the network operator can get a role in the multiplex operation, and it strengthens its position. The mobile network operator is a less significant player, since its network is not used for content distribution. If the content services are interactive and a feedback channel is required, the mobile network operator can get a role. It is also the case with the paid services, since the conditional access system should be operated by the mobile operator.

The other uncertain point of the broadcasting based mobile television is the end-device. It can be surprising, but even the evident role of mobile phones can be questioned, since it is only one option for television viewing. Other devices (e.g. PDA, enhanced MP3, game consoles) can substitute the phones and can offer a better viewing experience for the users. The fact that phones became the part of our everyday life and usually users do not go anywhere without it definitely means a competitive advantage for this device. But the small screen is a disadvantage and just for the purposes of mobile television the size of the mobile phones should not increase again to allow larger displays (Trefzger, 2005). The battery capacity is also a problem, since video viewing requires a lot of power. In the current technological conditions there is a trade-off between the mobile television viewing and the functional advantages of phones (small size, long battery life).

It is a challenge for mobile operators and other potential market players to find a business model for mobile television services. The development of the mobile communication gave several lessons in the last decade. According to Rogers (1986) the communication industry is characterized by tool technologies. The techniques can be applied in a variety of ways to diverse situations. The popular applications are shaped by consumer habits, by re-discovering the devices themselves. The popularity of SMS in mobile telephony was a surprise both for engineers and researchers. What is more, researchers had never thought that the diffusion of mobile technology would affect the television industry through the appearance of various votes. Accordingly, even though the development of infocommunication technologies is the result of well-planned business and engineering activities, the decision whether a specific service becomes popular or not rests with the people. The introduction of UMTS and the relative failure of these services also illustrates that consumers' behaviour do not exactly follow the expectations of corporate decision makers.

As Picard (2005) points out, no media or communication device can reach a 100% adoption, even the researches are based on this assumption. Evidently it changes the basic question of diffusion researches: the question is not purely the adoption rate and the speed of diffusion, but rather the practical limit of the diffusion. Corporations have long-term strategies and they make investments only in the fields that have a mass market potential. Mobile television needs a mass market even some of the contents may target only niche markets. It is not evident at all if this mass market exists. Anyway the main question is if there is a real consumer demand for mobile television services or it is rather a hype with a business failure at the end.

The basic platform for mobile television services is practically the strategic decision of market players. Obviously the mobile operators want to have a key position in the supply chain with the exploitation of consumer relationship. This service can increase the ARPU (average revenue per user) and opens the market potential of media industries. For the broadcasting companies this possibility means a new distribution channel for their content and they also try to get a strategic role in the service providing. The direction and level of vertical integration depends on the ability of these companies to exploit their core competences. The regulatory background (e.g. spectrum regulation, media regulation, special concentration rules) can also influence the strategy of the market players. There is no clear regulatory policy concerning mobile television even some national regulatory authority started investigating this field.

An attractive pricing model and price level is crucial concerning the success of mobile television. The basic pricing models are the same as in the media business in general (Trefzger, 2006):

- pay-per-view (time based, volume based, event based);
- subscription;
- one time fee;
- free models.

According to the expectations the subscription can be the most popular pricing model besides the free models of course. The experiences of the pilot projects also support this assumption (Holland 2006, TNS Infratest 2006). On the infocommunication market the flat-rate pricing proved to be most successful (cable television, broadband internet, mobile services), the usage based models are far less popular.

Combination of the different models is also possible. The subscription based pricing supplemented with pay-per-view events can be acceptable for the consumers and profitable for the operators. These contents have to be really premium contents, otherwise the consumers do not have any interest to pay additionally. Some sport events (e.g. premium soccer on the European market) can be suitable for this kind of pricing.

The FTA services can be also favourable for the users, the real question in this case the financial return of the service. It is uncertain if the content providing can be financed by the advertisers, reaching a critical mass is essential in this case. It is somehow the chicken-and-egg problem, without mass audience the market players do not finance the development of free content but without content the service itself is not appeal for the consumers.

The one-time fee is the least common (e.g. American digital satellite radios offer life long subscription for one time fee), but a premium price built into the end-device is also possible.

2. Consumption of new media services

Analysis of new media services is an emerging field in the media economics literature. New media is the totality of those mass communication devices and services which allow of the interactivity of services and the personalisation of media content (Urban, 2004). The 3G technology can maximally fulfill this requirement. In the case of broadcasting technologies it is less evident, even if mobile network can be used for feedback.

If we want to evaluate the market demand for the mobile television services, we have to identify some crucial points in the environment of mobile television. It is a brand new service but not without precedents. Some experiences from the media and communications market must be known to understand the main questions of mobile television services. There are general tendencies concerning media consumption patterns and they can also determine the market acceptance of mobile television services.

The first question can be if the audience is interested in mobile television viewing or not. In some cases the mass appeal of mobile television is not questioned at all (IBM, 2006). The logic behind this idea is the universal popularity of television viewing and the high penetration of mobile phones. Picard (2005) underlines the differences between telephony being a tool of interpersonal communication and broadcasting designed for one-way mass communication. The concept of mobile television blends these functions, but according to the experiences in the communication industries users prefer the separated technologies in the consumer goods.

Goldhammer (2006) compares the highly converged devices to the Swiss army knives. It can be really practical outdoors, but at home we prefer the usage of certain knives for different purposes and we open a bottle of wine with the corkscrew instead of the pocket knife. This phenomenon can be instructive for mobile phones: even if there are some practical advantages of converging the functions, mobile phone can remain a device primary for personal communication. It is not evident at all if the users want to substitute the current high-quality consumer electronic equipments with a new device that offers a more limited viewing experience.

The other question is more about the content type desired by the mass audience. For a long time the „content is king” concept has been prevailing in media economics literature. Concept of Odlyzko (2001) questions the hegemony of professional content and emphasizes importance of connectivity. User-generated content (UGC) became a buzzword in the last years and according to Companie (2006) it can be a driving force not only for the Internet but also for mobile communications. Since cameras are also included in the phones, the civil content providing can be especially important in some breaking news situations (terror attack, accident, etc). The mobile phone owners can become correspondents immediately, as it happened on Internet portals several times in the last years. Its real technological environment is the 3G, in the broadcasting model the viability of UGC is less evident. From this point of view the development of mobile Internet can be threat to the mobile television market.

The UGC phenomenon can have an impact also on the business model and the pricing strategy. Users are generally more willing to pay for two-way interactive and interpersonal communication services than for one-way content services. It can give a priority to the interactivity and personalization in the business development of mobile broadcasting (Tadayoni-Henten, 2006). It obviously favours to the personalized content providing of 3G networks against the mobile television services offered on broadcasting networks.

We have to recognize that mobility is a trend in media consumption as well as time-shifting. It is a natural desire of users that they are want to consume the media services where and when they want. The change of 'technological push' models into 'market pull' models in communication industries reflects this expectation. Nowadays free time is limited and it is a clear interest of consumers to kill time when otherwise they have to wait for something or they have spend time somewhere without any kind of activity (waiting in a queue, sitting on a bus). No doubt, mobile television can be suitable for this purpose.

The highly personalized mobile television services can theoretically fulfill the requirements of the consumers, but several practical questions arises. No one knows the exact consumer needs concerning the content and quality issues, and crucial question is how much the users are willing to pay for the services.

3. How the consumers accept the mobile television services?

Even most brilliant technologies and innovative business models can fail, if there is no market demand for the product or the service. Even if the success of mobile television seems to be evident because of the popularity of television and mobile phone, the introduction of the service has a business risk. Concerning the potential market demand for the service we have to ask some basic questions:

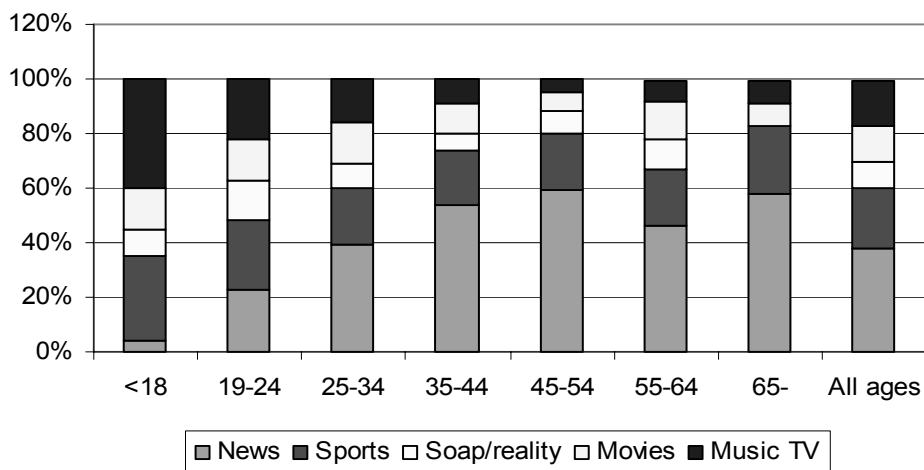
- Which content type can be the most appealing for the consumers?
- How much are they willing to pay for mobile television?
- In which situation, for what purpose do they use mobile television?
- Where do they watch mobile television?
- How much time do they spend on watching mobile television?

There are only a few commercial mobile television services (at least with broadcasting technologies). We can get a picture about the attitude of consumers from the pilot projects. The results are partly available and there are some surprising findings.

Content

Users are interested in those programme types that are well known from traditional television, but not all the genres are equally enjoyable on mobile phones. According to the research of A.T. Kearney conducted in twenty-one countries the news and sports programmes are the most popular. In the young age groups music content seems to be extremely attractive. The different preferences in the age groups is illustrated in Fig. 3.

Fig. 3: „What type of TV programmes would you be most interested in”, by age



Source: A.T. Kearney - University of Cambridge (2005)

Pilot projects give similar results, news and sport programmes are the most popular. The first commercial DVB-H service in Europe was offered by 3 Italia in June 2006. The timing was not left to chance, the introduction was connected to the World Cup. The triumph of Italian national team was an exceptional luck for the service provider, it obviously boosted the subscription base. At the end of the World Cup 3 Italia had 111.000 subscribers and expected 500.000 mobile television clients by the end of 2006.¹

Due to the relatively small size of the display and also because of the short and fragmented viewing situations, the other premium content, the movies will be probably less popular on mobile television platforms. In Korea and China special made-for-mobile films were produced with a commercial success. They are different from traditional movies, editing is more fragmented and unconventional camera techniques are used (Orgad, 2006).

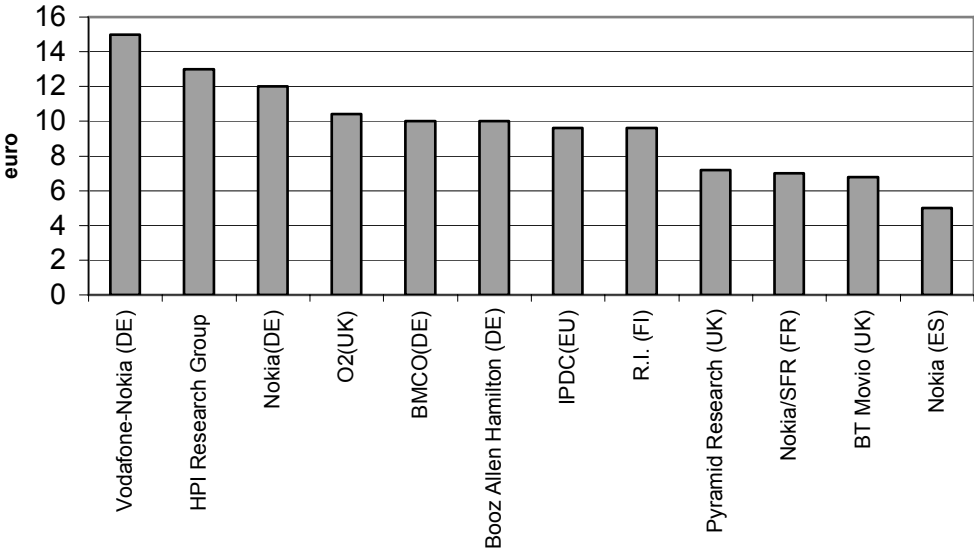
It is the question of the future if the mobile television stimulates the specialized content development or the contents developed for traditional television will be suitable for mobile usage. The so-called *mobisodes* (short versions of serial episodes) developed for mobiles are popular, but this kind of content development is relatively costly. Mobisodes were produced for some well-known series (Lost, Dr Who) and some mobisodes were also produced in Hungary based on two popular domestic series. They were available as part of the 3G services without any significant success.

Pay willingness

The return on investments of programme developing is highly uncertain. The pay willingness of the users is relatively low, as the different research results illustrate in Fig. 4. This sums can change as more and more content will be available on the mobile platform and users consider the service as the part of everyday life.

¹ Probably this expectation was not realized, since 3 Italia has not published any subscriber information since July 2006. It is somehow informative in itself. (Relevant information about the 3 Italia mobile television service are available on <http://www.dvb-h.org/Services/services-Italy-3Italia.htm>)

Fig. 4: Willingness to pay (monthly in euro) based on different research results



Source: BCE (2006)

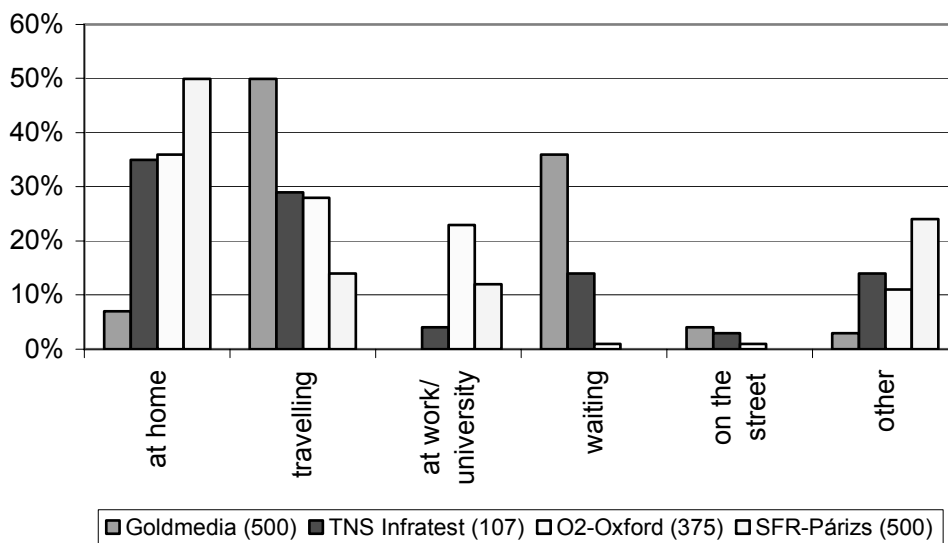
The premium contents can have high revenue generating potential. Countries having popular sport content and high demand for that (e.g. soccer in UK, Italy, Germany, Spain) are in favourable situation. The lack of domestic premium sport content hits several smaller countries, it can have an effect both on the ARPU and the number of subscribers.

The question of the adult content is also highly uncertain, maybe mobile phone is not the most suitable device for viewing this content type. But it must be added that adult content could find its audience via any kind of medium (print media, television, internet) and it could be a mistake to underestimate revenue generating potential of adult content. Unfortunately it is not an easily researchable area, the pilot projects do not say a lot about it. Orgad (2006) points out, that ca. 30% of video content viewed on mobile device outside the U.S. is pornography. Anyway we have to take it into consideration if we want to get a picture about the market of mobile television.

Viewing situations and venues

The question of place or situation where consumers view mobile television is also important. The research results show that consumers watch mobile television not only during commuting or at work but also at home. It means that mobile television can substitute the traditional television or at least it can function as a secondary set in the household.

Fig. 5: „Where do you use the service most often?” – results of different researches



Source: RTR (2006), TNS Infratest (2006), Mason (2006), LesMobiles.com. (2006)

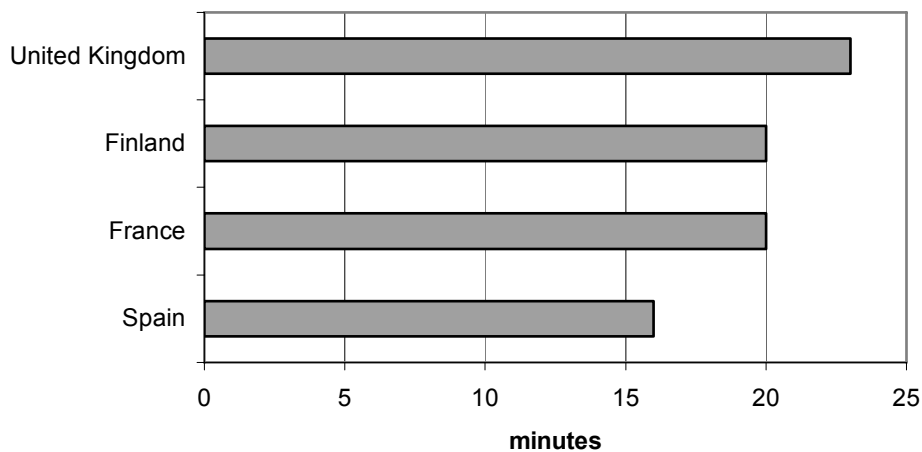
The relatively high proportion of the home viewing is somehow surprising. At first sight the core competence of mobile television can be its immediacy and flexibility. Consumers can get the desired content where and when they want and they do not miss the breaking news. The entertainment part can be also important when people have empty times and they are bored. But the home viewing reflects a different kind of motivation, since traditional television and internet is much more suitable for being entertained or for information seeking.

A potential explanation can be that mobile device can create a really private environment in the household (e.g. in the case of pornographic content it can be an evident need). Or the portability can be a useful feature even inside the house and television content can be available even in the rooms where otherwise not (e.g. kitchen or bath). Anyway these are only speculations, consumer researches should aim to find the motivations of home-viewing of mobile television.

Time devoted to mobile television

The market potential of mobile television highly depends on the time devoted to viewing. It became also obvious that participants of the pilot project did not spend too much time with mobile television viewing.

Fig. 6: Average daily viewing of mobile television services (based on different pilot projects)



Source: <http://www.dvb-h.org>

The results of the latest pilot project, just finished in Stockholm have similar results. The 62% of the participants spent 1-25 minutes on a day with mobile television viewing, and they mostly watched it in the morning and evening (Bergdahl, 2007). The expectation that mobile television can reshape the television prime time, giving a higher importance of daytime viewing has not been proved.

Generally the pilot projects cannot make the potential investors really optimistic. There is a demand for mobile television services in certain situations and for certain type of content but this demand is limited. The return on content development can be risky, but the programmes originally developed for traditional television are not always enjoyable on mobile displays.

4. Conclusions

Mobile television services are relatively new on the market. There are some commercial offers (especially based on 3G technology), but most of the research results are coming from surveys and pilot projects. The market players face with a dilemma. On the one hand the 3G services are relatively well known, the possible business model is more or less clear but the mobile television cannot be really popular. A possible reason can be the high prices that are consequence of the high costs. The economies of scale is hardly prevails in this case, because of technological reasons. Due to the point-to-point connection the costs increase by the growing number of users.

On the other hand the broadcasting technologies have a high risk now. The business models are not clear, the role of the mobile operator is uncertain. It has higher investment costs (a broadcasting network has to built out) but due to the broadcasting technology the capacity planning is less problematic. Since the media consumption is more and more about the interactive and personalized services, the one-way broadcasting technologies would be less preferred by the consumers. It will be a challenge for market players to integrate the advantages of the two technologies and to offer an attractive service to the consumers at a competitive price.

The behaviour of the consumers is also a question. The technological development is much faster than the change of consumption habits. In the infocommunication sector the pull model becomes prevailing instead of push models, but overall the technological possibilities highly

influence the market development. The competition for the free time and money of the consumers is more and more intense. Mobile television can be competitive, since it can be for killing time while waiting, commuting, etc. But the rationality is not enough for the market success. The emotional aspects, like the new viewing environment (e.g. on the street or on bus) or just the subjective perception of the quality can negatively influence the diffusion of mobile television services.

There are other uncertainties concerning the mobile television development. Mobile operators can easily cannibalize the mobile television market with the introduction of mobile internet services. If consumers can reach the internet with the mobile phone their need for information and entertainment content in empty times will be fulfilled. Of course other technologies and other devices can be also a challenge for mobile television market. The free city WiFi systems and the high diffusion of mobile devices (laptop, PDA) can mean a real threat to the emerging market of mobile television.

The basic assumption of the researchers and operators was that consumers view mobile television when they want to kill time. The pilot projects do not prove this assumption, and based on this finding probably different kind of program development strategy is required than it was thought before. The broadcasters have been searching for killer application in interactive television for long years, and it seems that mobile operators try to do the same. In the case of interactive television Van Dijk and de Vos (2001) compared it to the searching for the Holy Grail. Maybe the mobile television market players prove more successful in finding the killer application.

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Video – On – Demand: Towards New Viewing Practices?

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Abstract¹

In this paper, we focus on the user aspects of a specific television service, video-on-demand (VOD), offered on two platforms: TV and computer. The concept of video-on-demand has already for a long time been the subject of new media research, first in its analogue version and more recently as a digital service. The main asset of this functionality, embedded in different devices, is that it offers the ability of video content being watched at any time and thereby enables extensive ways of time shifting. Furthermore, there is a possible expansion in available content, made by professionals as well as amateurs.

Therefore VOD has the technical capability to fundamentally change our viewing patterns and practices. The question is however: How does the audience domesticate this new kind of audiovisual content and (how) does it fit in with their everyday viewing practices?

Based on an environmental scan consisting of an extensive literature review, this paper synthesises knowledge on existing viewing practices as well as the video on demand's new affordances. Possible shifts and interactions are investigated and new research questions are being identified.

Introduction

Our most traditional and popular mass medium, television, is undergoing major technical changes. The digitalisation of television offers the viewer the opportunity to take over control of the broadcast scheme and become the master of his own time. If he wants, he can interact with the offered content in various ways and even become a content-producer. Next to that, the viewer is also not limited (anymore) to the television set, but can also watch TV programmes and other video content on a computer or a portable device.

In this paper we will focus in an exploratory way on the user aspects of video – on – demand offered on two platforms: TV and computer. On-demand services promise the viewer the functionality of watching any content at any preferred time, that way enabling extensive ways

¹ This paper is work in progress. It structures some of our findings and expresses some of our thoughts in relation to video on demand and viewing practices. Please do not quote without the authors' permission.

of time shifting. For this we will look into some of the promises VOD makes and try to contextualise them. Starting from the existing viewer practices, we will explore how and if these new affordances will lead to concrete new user practices. The question we will try to answer in this paper is: “*How do these new TV-related technologies like VOD interact with existing viewing practices?*”

The theoretical framework to answer this question is largely based on the domestication theory (Berker, Hartmann, Punie, & Ward, 2005; Silverstone & Haddon, 1996). On the empirical level, the research findings from an environmental scanning of existing knowledge on viewing practices and VOD will be discussed. Environmental scanning is a research technique applied specifically within institutions, in order to determine strategic planning and goals, based on understanding the external environment and the interconnections of its various sectors (Morrison, 1992). But the technique is also being used in future studies and trend watching, to provide an early warning on significant socio-technological changes and to detect ‘weak signals’ of new trends (Uskali, 2005). One of the methods used in environmental scanning is an extensive database literature review (Morrison, 1992), which we applied in this study. In our environmental scan, VOD is placed in a broader perspective, by looking at different contextual factors that can influence the present and future usage of VOD (time spending patterns, viewing habits, household budgets etc.). Existing data on VOD usage patterns are also being analysed.

This paper is exploratory in nature, identifying some existing trends in the use of on-demand-video viewing and raising some concrete future research issues and questions.²

The specific questions we will tackle in this paper are:

- What are the existing viewing practices?
- How can viewing practices be influenced by VOD services? We will explore this possible impact on three specific areas: time, place within the home and content.

Based on this first analysis, we will define specific research questions that need to be answered in our field study.

1. Television’s existing practices

An important idea is that technologies or products only exist in the everyday practices. The relation between product and practice is dynamic, meaning that it co-evolves. Practices exist as recognisable entities but at the same time require constant and active reproduction or performance. “*Practices show how consumers and producers change within social and material structures and how they also effect changes in these structures*” This means that practices exist as recognisable entities, but at the same time they require constant and active reproduction (Hand, Shove & Southerton, 2005). Therefore a ‘practice’ is seen as a routinised type of behaviour, which consists of several elements that are all interconnected to one other. It is like a way of cooking, of consuming, of working of investigating, of taking care of oneself or of others, etc. (Reckwitz, 2002). This also refers to the idea of Oudshoorn & Pinch, that there is no essential use to be derived from the artefact itself and that technologies should be studied in their context of use and users and technologies should be seen as co-constructed (Oudshoorn & Pinch, 2003:2).

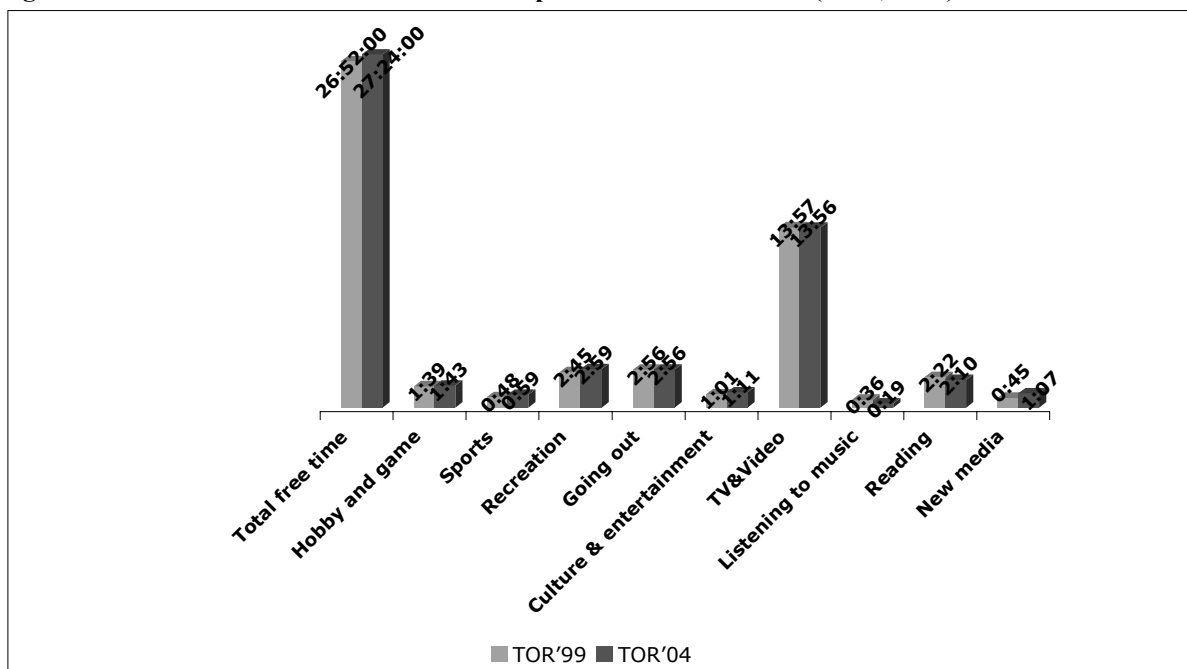
² This paper fits into the first phase of a research project concerning video in the home, Video Q-SAC. In this project the use and requirements of video-in-the home will be explored in-depth, with a concrete focus on on-demand video services on TV screens and specifically also on the computer, which is relatively new.

On the meaning of TV for viewers and the existing viewing practices, many studies have been conducted (Silverstone, 1994; Bauwens, 2002; Lull, 1990). Television is the medium with the widest implementation in households. In 1948, only 0,3% of the UK population had a TV set, but by 1958, this was 52%, rising to over 90% in the 70's and reaching 99% by 1996 (Hamill, 2003). It is also a medium that is fully **domesticated**, meaning that it is completely integrated in our daily lives and habits and forms an important part of it (Silverstone, 1996).

1.1. Television dominance

Watching television is a **time-consuming activity**. An extensive part of our day, and more in particular of our free time, is dedicated to watching television. When people are at home in the evening and they are free, they watch television (Bauwens, 2002). This is also clearly demonstrated in people's time spending patterns. The Flemish research group TOR, found that watching TV and video is by far the most important activity people conduct in their 'free time', which can be defined as the time people can fill in with the activities they prefer. Of our total time budget, 16% is free time. In the graph below, our total free time is expressed in hours and minutes, as well as how people divide this free time in different activities. The reference period is one week. The graph shows there is a small rise in the total amount of free time people have available, with 0,23% or 32 minutes a week (TOR, 2004).

Fig. 1: total free time and free time activities expressed in hours a week (TOR, 2004)



It is also clear that viewing times have stayed constant between 1999 and 2004. The total share of TV & Video in people's free time was 51,2% in 1999 and 49,8% in 2004. This means that half of people's time off, or the time they can fill in with activities they like, is filled with watching TV. The average time spent on using new media, like a personal computer and the Internet, has increased with 22 minutes, but this is still only a small share of the total free time (4%). It is also clear that the additional time spent on using new media does not come from the TV time, but from the small rise in our total free time and from the time spent on reading and listening to music which both diminished. Youngsters between 18 and 24 years old watch less television than others, which is also reflected in a smaller percentage of their total free time. However, when we look at the usage of new media in this

group, with an average of 2h25 a week, this is more than in other groups, but still less than watching TV. So for these groups, watching TV is still an important activity. The group between 25 and 39 watches the least in absolute hours, but their free time is also the most limited. When we look at the average viewing times a day in Flanders, we can see that these stayed relatively constant over the years. There is even an increase, as in 1997 the average viewing time was 162 minutes per individual and per day (children included). In 2005, the average viewing time was 178 minutes a day (APS, 2006). This shows that although there are new ways of managing our TV time, an extensive part of our day and more particular of our free time is still dedicated to watching television. But despite these high viewing times, television is not regarded as a prior activity. If something else comes up, for example a visit from friends, people sacrifice their TV viewing. This is also described by Burton: “*Television is not life, although it’s a part of our lives*’. It’s hard for people to imagine themselves a life without TV, but there are more important things than watching TV, like social contacts (Bauwens, 2002:300).

1.2. Television experience

The fact that television is such an important part of our daily lives, is linked to its specific characteristic of giving **structure** and rhythm to our lives, by providing a sort of focal point for families, and acting as a sort of timetable. The time we start watching, the fixed appointments with broadcasts, all give a structure to our lives and make that watching television is a routine for most people. This is also translated in the central place TV has in the living room. The TV offers stability, not only physical, but also in the routine it provides, which makes people feel like part of the community, while watching (Silverstone, 1994; Bauwens, 2002; Peters, 2003; Taylor and Harper, 2003; Boyns & Stephenson, 2003). The television experience is determined by viewing behaviour, the social dimension and the scale of experience.

1.2.1 Viewing behaviour

The aspects of structure and routine have also an impact on the way people watch television. In a way, television is an easy medium and watching television is mostly a **lean-back activity**. Watching television often means relaxing and allowing us the right to do nothing³. The core elements of this viewing behaviour are:

- People first make themselves available to the medium, and only then they start watching it.
- Although people watch a lot of television and the fact that this structures their evenings at home, only few programmes are perceived as a real ‘must’. This means that often people choose only for the medium itself but not necessarily for a specific content.
- Even though people have certain program preferences, choosing the content happens most of the time in an irrational way. Not always the nicest, most beautiful, most attractive or most interesting programmes are being watched. Often people just switch on their television set and then they start to choose the (type of) program they want to see.. This means that the choice of the programmes that are watched, are the result of switching on the television set rather than the reason for switching it on. (Bauwens, 2002: 167-288; Pauwels & Bauwens, 2004: 83-84).
- The element of “willingness” plays an important role with regard to the viewing behaviour. ‘Willing’ refers to the fact that once people have made themselves available for the medium, they often keep watching, even at programmes they are not

³ (Therefore viewers are often also referred to as ‘couch potatoes’)

particularly satisfied with (Bauwens, 2002: 385-389). When we look at viewing figures, we can see that entertainment programmes as well as the news are the most – watched programmes.

1.2.2 Social dimension

Another important characteristic is that television is still regarded as a **social activity** and a family event. Although there is a multiplication of TV sets in our houses, there is often still one TV-set placed central in the living room, on which programmes are being watched together. People like watching together, although this does not automatically mean that there is conversation on what they see (Bauwens, 2002).

1.2.3. Scale of experience

Watching television can have different levels of experience. We notice that television is often used as a **secondary activity**. More and more, TV accompanies us while we are doing other activities, like surfing the web with the TV on in the background, ironing in front of TV, reading while the TV is on etc. Therefore we distinguish three levels: (Van den Broeck et al., 2006; Lievens et al., 2007)

- TV in the front: this is the most active form of watching television. No other activities are being performed.
- TV on the side: people are performing one or more ‘primary’ activities while also watching television. The latter is secondary to the other tasks.
- TV in the back: in this setting television is no more than a kind of wallpaper. There is no form of active watching at all.

TOR calculated that in 2004, TV was a side activity for an average of 2 hours a week (TOR, 2004). Peters (2003) noted that the TV set as background or wallpaper is specifically used by younger people aged 18-25, but also in other research this simultaneous use of television while conducting other activities was noted. Lull (1990) describes television in this respect as an environmental resource, creating a flow of constant background noise. He sees that television becomes a companion for accomplishing household chores and routines. This has of course an impact on on-demand viewing, as this means that our viewing behaviour is not always attentive.

Although the characteristics of television (viewing behaviour and the television dominance) indicate that it is an important part of our daily lives it is clearly not the most important aspect. These characteristics of traditional TV also suggest that the act of watching television as such seems to be more important than the content we are watching.

With these observations in mind it is interesting to look at the affordances of video – on – demand (VOD). Affordances may be defined as the combination of *'perceived and actual properties of the thing - primarily those fundamental properties that determine just how that thing could possibly be used.'* (Norman, 1988; see also Gibson, 1977; Newman, 2001; Pierson et.al, 2006). We will explore the specific affordances or inherent properties of the service as well as its possible impact on the existing viewing practices as we have summarized them.

2. Video – on –demand: new affordances?

The traditional viewing practices as we described above, could be influenced by new television add-ons. One of these add-ons is the feature of video-on-demand. Important to

recognize is that this service is not only linked to television as such, but also to other types of platform like e.g. the computer.

2.1. What is video-on-demand?

Video-on-demand as a service exists since the nineties (Ling, 1999) and refers to a technique that offers viewers the possibility to watch what they want, when they want it. It is one of the services that enable people to time-shift, or in other words, to break loose with the existing broadcasting schedule. Technologically, video-on-demand systems provide content over a network, by sending it to a PC or a set-top-box linked to a TV-set. This can work either via downloads or streaming. The difference for the user is that with download, the entire movie or program first has to be stored on the set-top-box or the computer. With streaming, the content is streamed to the user, who can watch it immediately as the video streams starts. The latter is the main reason why the majority of the cable and telecom companies use the streaming technique when offering VOD-services.

Next to the basic functionality VOD also offers the viewer the typical video recorder (VCR) related functionalities like pausing, fast forward, rewind etc. (Rajapakshe & Quek, 1995).

A related service that also enables viewers to watch on-demand content, is the personal video recorder or PVR. This system can be used for “push video-on-demand”, a service Sky will use to place additional content automatically on people’s hard disk (Sky). People can also simply program their personal video recorder or PVR to record or download programmes on its hard disk. The personal video recorder is mostly linked to an electronic program guide (EPG), in that way enabling users to simply select the programmes they want to record from the EPG. Thus they can record one program, but also all episodes of a series at once. Furthermore it becomes possible to look for specific content to record, e.g. all movies with Richard Gere. The PVR also makes it possible to pause live –TV. In Europe, PVRs are available since 2000. It was announced as the replacement of the VCR, but due to high prices and its unfamiliarity, the devices had low adoption rates (Whittingham, 2000). Since the implementation of interactive digital television however, these PVRs were also integrated in set-topboxes, which will lead to a higher familiarity for TV viewers, as they are integrated in the digital television package. The common aspect in all these described systems, is that they offer viewers the potential to watch their preferred content at any time they want.

Besides VOD there is also near video-on-demand (NVOD). This is a video technique that broadcasts multiple copies of a program at short time intervals (10-20 minutes), giving viewers the opportunity to pick in every 10-20 minutes. This is a typical pay-per-view service in which people pay per program they watch.

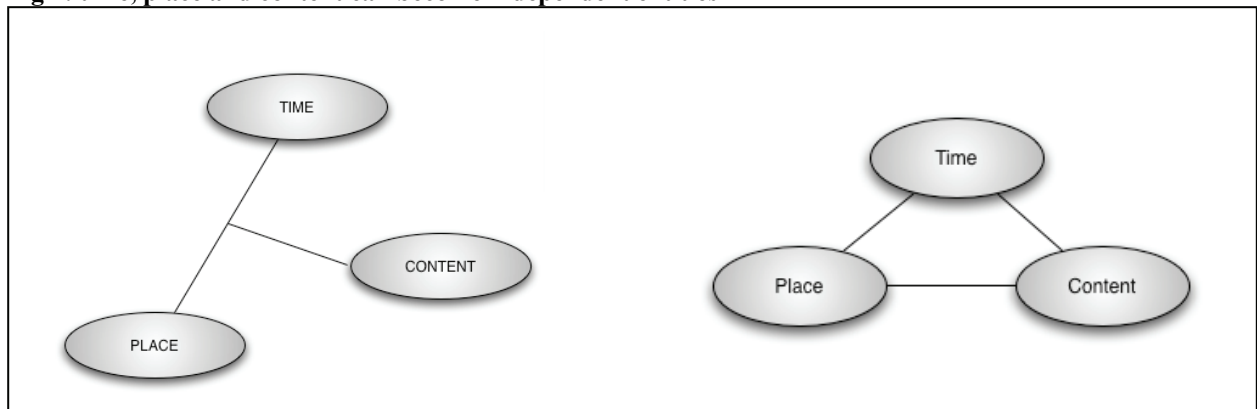
2.2. Video-on-demand’s possible interaction with existing viewing practices

The service of VOD intrinsically could have a great impact on the viewing patterns of people. The main question therefore is (to see) to what extent VOD interacts with existing viewing practices, keeping the characteristics as described above in mind? Technologically seen, the system of on-demand viewing entails the possibilities of managing both our time spent on watching television and the content we watch. Video-on-demand also enables watching video content on other screens (e.g. the PC screen), that way influencing the place of the TV set in the house.

Traditional broadcast television was determined by three dimensions: time, place and content. A certain type of content could only be watched at a certain time at a certain place. With VOD this interrelation between these dimensions disappears. This could even be to the extent that they become completely independent from each other. Then, any type of content can be

watched at any given time at any given place. Therefore we will elaborate on these three elements in the next paragraphs.

Fig 2: time, place and content can become independent entities



2.2.1. Time dimension

Video on demand entails the promise of becoming “a master of our own time”, by offering the possibility to manage our own time. People can use VOD services at the timing of their choice, without the constraints of fixed broadcasting time schedules. One of the ideas is that by offering users more flexibility in organising their lives, this may lead to saving time (Haddon, 1999).

Both time and money are scarce resources for many households. But as our financial budget increases over the years with the growth of the economy, our time budget never changes, as there are only 24 hours a day. In contrary, due to the 24/7 society one could have the impression that the available time seems to be decreasing. Therefore time is probably the scarcest resource for households (Punie, 2000; Hamill, 2003). The changes in time spending patterns have been researched via time use diaries over the years (Haddon, 2001; TOR, 2004). These researches show that our time management is the result of a constant balancing between different categories: commitments (e.g. work, studies, household activities; physical needs (e.g. eat and sleep), time off, social participation, time on the road and waiting (TOR, 2004).

The assumption that the development of different types of new (time-saving) technologies would provide people with more free time cannot be taken for granted. Hamill (2003) investigated the spread of labour-saving devices in the houses. Her hypotheses that an increase of labour-saving devices in the home, like dishwashers and microwave ovens, would lead to more free time, proved to be false. Home entertainment devices like radio and television were diffused much faster than kitchen appliances. And those entertainment devices are more time-consuming rather than time saving (television, compact disk player). Particularly in lower income households, more entertainment devices than time-saving devices are present. Flemish research on TV habits showed that socially disadvantaged groups, like unemployed and elderly people, spend a lot of their time on watching television. This can be attributed to the fact that television is a relatively inexpensive time spending activity, and as already mentioned earlier, watching television offers us comfort (Bauwens, 2002).

The structural aspect of TV-viewing leads us to believe that people will not be eager to save time to watch only those programmes they prefer on-demand. The idea that people will save

time using VOD services, starts from the hypotheses that people now are forced to watch programmes they don't like, for example a less preferred 'bridging' program between two programmes they do like. Using VOD, they could be able to save time by only watching the two preferred programmes, that way reducing the total time spent on TV. However, this is not likely, as television clearly forms an important part of our daily lives and the activity of watching television is often more important than the content that is actually watched (Bauwens, 2002, *supra*).

A. The VCR (video cassette recorder)

Specific for Video on demand, is that its affordances are not new. Since the end of the 70's, a device with a similar promise already exists: the VCR (video cassette recorder). Existing research on the usage of the VCR, enables us to explore both the time dimension and the content dimension in relation to VCR user practices. When the VCR was introduced in the seventies, it was perceived as a revolutionary but costly device that would "*free viewers from the constraints of mainstream network television by making them more autonomous in their viewing decisions.*" (Van den Bulck, 1999). In other words, viewers could gain control over viewing time and choice, as they could watch selective. When we look at the time dimension, we can see that one of the expectations was that VCR use would lead to a reduction of the total viewing time, as people had the possibility to time-shift and could only watch those programmes they preferred. The viewers could also better control the specific viewing conditions, as they could also use the VCR to skip commercials for example. Furthermore, it could lead to a diversification of the viewing diet, as people were also able to watch other and more content that was broadcasted on inconvenient hours. (see also Van den Bulck, 1999)

But when looking at the real usage, we noticed that the possible shifts in both time shifting and selectivity (see *infra*) did not occur as expected. A survey in Flanders conducted in 1994 by Van den Bulck, showed that, although 68,8% of the respondents owned a VCR, only half of the respondents used their VCR to record programmes regularly and only a similar percentage rented tapes regularly. There was also no evidence in the data that suggested that VCR use was linked to watching a more limited number of program types or watching less television (Van den Bulck, 1999). Other studies confirmed that the increase in TV watching due to the VCR, was not very significant (Hamill, 2003).

The main reason for this all is to be found in the user practice. First, the only decision that people make is whether or not he or she wants to watch TV. (see higher) Secondly, linked to the scale of experience (see above) Hamill (2003) makes a distinction between focused and background watching. People will only record those programmes they really want to watch and many of the recorded programmes are not watched at all. Thirdly, this is also linked to the social dimension. The VCR is for example also used to reduce viewing conflicts, e.g. recording a soap and watch it later on, because other household members do not like it. (Gauntlett and Hill 1999) This illustrates that the VCR, which mainly is a time-shifting device, has no significant impact on the entire viewing experience. Instead of being used as a time management device, it was used as an additional channel in the viewing repertoire. Some people will use it actively, but for others it will be a channel they only use sporadic. (Van den Bulck, 1999).

B. The PVR (personal video recorder)

The promises the VCR made in the early eighties, giving the viewer better management of his or her viewing and a better selection of programmes, are very similar to the promises that are made today with personal video recorders (PVR) and on-demand video viewing. An important question is if these "new" ways of viewer autonomy will in fact lead to new

viewing practices, or is the usage of the VCR a good prediction of the use of video-on-demand and PVRs?

The PVR, was announced as the follow-up of the VCR (videocassette recorder) (Whittingham, 2000). The PVR offers the same functionalities of time-shifting, but the combination with an electronic program guide (EPG) offers an important improvement concerning usability compared to the VCR. Instead of recording programmes time-based, people can record programmes item-based, by selecting them in an EPG. It is even possible to record all episodes of a series at once. This could lead to a more extensive use of time-shifting functionality. When we look at how people perceive video-on-demand as a new technology, we can see that they relate it with two existing technologies, their TV set and their VCR (Ling, 1999)

An early study of the use of a VOD system (1995-1996) focussed on the domestication of the technology in the home and more in particular on what is called the metaphorical integration in the mind of the user and the physical integration in the home and specifically into the living room. The tested VOD system was often seen as an entertainment system similar to the video player, because of its close association to TV as well because it had similar functionalities as playing a movie and stop or rewind it. People saw it as a kind of video machine that *“you can pick and choose what you want to see”*. One of the participating couples described the system as: *“I don’t know how the technical system functions”*. *It is probably just channels and videocassettes that stand there. His wife said: No, they are disks that everybody sits and looks at”*. (Ling, 1999). This last remark is important, as it relates to the idea of *innovation through familiarity*, in which people have to be able to relate to something they already know (Lievens, Van den Broeck, Pierson, 2007). Next to that the study also clearly indicated that users used the VOD system at roughly the same times they used regular broadcast.

The video metaphor also guided the expectations of the users of the service: they placed it in the sphere of entertainment, had specific expectations on the functioning (pause, rewind) and even had specific expectancies on pricing strategies. An important difference was that people did not have to leave the house to rent a video anymore, which was also seen as an important advantage. (*“For me it is simply that with videotorg I avoid the trip to the video store to rent a video, I get it right in my living room.”*) However, this positive aspect was immediately linked to the concern that the system would lead to the impulsive ordering of movies and some people feared that it might steal time away from other activities. The test participants could use the service for free, but they did compare the service to the price of a movie in a video store. *“If the price to see a film was competitive with rental of a film in a video store that would be acceptable”*. Some people in the trial also wanted to use it for a fixed fee and others would want to pay only for what they used (Ling, 1999). This relates to the findings of our own research, that people want to be in control over costs at all time (Van den Broeck, 2006).

The above findings are also being confirmed in other research on the use of hard disk recorders or PVRs for time shifting: (see SPOT, 2006; Van den Broeck, Pierson & Pauwels, 2004)

- The use of these type of devices are limited in relation to the total viewing time (only 7-8% in the Netherlands, and 13% in the UK; SPOT, 2006)
- The time-shifting element is only relative in relation to time; the delayed viewing is often consumed the same day as the original broadcast
- The option of time shifted viewing in real time is not frequently used

- When recording a program this is not so much a time shifting element, but mainly because people simply don't want to miss specific programmes. Recorded programmes are mostly watched the same day or one day later.

Although the most known American stand-alone PVR, Tivo, was not adopted as successful as hoped for, the user rates of Tivo's early adopters are much higher compared to the European figures, as 70% of the Tivo owners use their device on a daily bases to record and to time-shift programmes. This is mainly linked to the commercials that are interrupting programmes more often in the US, as well as the fact that Tivo is being used more intensive, because it already exists longer in the US. (Whittingham, 2000; (Arbitron, Cable study, 2006))

Our own focus group research shows that people do appeal to the opportunity to break loose with the traditional TV system and to fit the incoming flow of content to their own needs. This is also one of the most important triggers for people to switch to digital television. People like being in control, and being able to time shift puts them in control over the existing broadcasting system. However, this will not necessarily mean that people will use the opportunity drastically. The first test with interactive digital TV in Flanders, e-VRT, showed that people do indeed shift the starting hours of their favourite programmes by means of the PVR and electronic program guide, but in their selection, they often stick to old viewing habits and taste preferences. The time span, in which they watched television, was also still the typical prime time television hours. This means that the purpose behind this program selection was not to reorganise the whole viewing evening autonomous, free from the classical broadcasting scheme, but to simply postpone prime time programmes to later on in the evening, when people had the time to watch them. (e-VRT, 2003; Van den Broeck, Pierson & Pauwels, 2004).

This overview on time-related aspects, leads us to some concrete ideas we will take into account in our further research on in-the-home video. One important finding is that for now, VOD and time-shifting is not really used to reduce the actual viewing times.

2.2.2. *Content dimension*

Another technical promise of VOD is that it enables a more personalised viewing behaviour. People will be able to adapt the broadcasting schedule to their own needs and thus watch only those specific programmes they really prefer. This is not only related to the time-shifting functionality, as described above, but people can also select only those programmes they really enjoy. The available content in that regard will be (in the future) unlimited and therefore people can personalise and adapt the existing TV broadcasting schedule. Subsequently, video on-demand can even make traditional broadcasting companies unnecessary in the future, as people can make their own choices 'à la carte' and choose between a range of series, soaps, documentaries, movies etc. Furthermore, convergence and the increase in Broadband capacity and availability have made the Internet an additional source of video content. This content entails both existing TV content (series and movies) but also a range of user generated content. People make their own movies and place them on popular sites like You Tube and my own TV, although this should not be overestimated, as only 1% produces most of the user generated content, 9% produces a little and 90% only consumes the content (Nielsen, 2006). New technologies like Windows Media Centre and Apple TV link these two different platforms, that way enabling convergence.

A. Content selection

Important to estimate the impact of this new content dimension is the way people select their TV-programmes. The analysis of (the aspects of) our existing viewing patterns (supra) showed that the act of watching television is often more important than the content that is watched and that people not always watch only the nicest programmes. However this does not mean people never select programmes or aren't interested in watching on-demand content.

Taylor and Harper (2003), distinguished three periods of television viewing, that each have their specific selecting mechanisms regarding the content that is watched:

1. *Coming home viewing*: This period can be described as “switching on to switch off”. Switch off from school or work, to start the process of relaxing. Taylor and Harper found that this viewing was highly disengaged viewing. In this period, programmes are mostly selected unplanned, by zapping through the channels. Little or no use of program guides was made in this period. The channel surfing feels like it is effortless and requires little thought. Furthermore, the channel surfing is immediately related to watching television. People are already watching, while they are surfing the channels.
2. *Mid-evening viewing*: This period often runs through dinner and lasts until 8.30-9 pm. This is what is typically called the prime-time period. In this period, there is planned viewing of specific programmes and therefore engagement is also higher. This is called viewing by appointment. These programmes are often viewed together, and they also structure the activities of people, e.g. preparing meals before the soap starts. (This relates to the routines in viewing, people know which programmes are on).
3. *Later-evening viewing*: This type of viewing takes place when all the daily chores are completed and last until 11 or 11.30 pm. This viewing has a relatively high level of engagement in the households. People then seem to have specific types of programmes they like to watch. Documentaries, current affairs programmes and dramas were popular. In this phase, program guides are often being used for short-term planning of which programmes people want to watch.

The analysis of Taylor and Harpers' three viewing periods indicates that it is especially the level of engagement that is central in the determination whether people just watch TV (according to daily routines and patterns like first the news and then a soap opera) or actively select programmes. This is also linked to the scales of experience (see higher) in watching television.

When looking at the existing user research on the VCR, and the specific relation with the selection of the content, the following outcomes can be distinguished (Van den Bulck, 1999):

1. Viewers may watch “more of the same”, e.g. they are watching action movie A and recording action movie B at the same time;
2. Viewers could also buy, rent or record content that is not shown on television or which is not available in their normal viewing hours. It is only in this second case that VCR use leads to diversification;
3. Viewers may also just rearrange the broadcasting schedule and that way making viewing more convenient or eliminating programming conflicts. Then the viewing diet does not change much or not at all

4. The number of genres correlates with the amount of time that people watch television. The more viewers watch television, the number of genres they watch increases. Only for heavy viewers, this is the opposite.

The findings above may suggest that VCR usage mainly leads to a diversification of the viewing diet and that people who use their VCR a lot, watch more television. However, Van den Bulck warns that, it is also possible that the findings merely suggest that heavy viewers of television are also heavier users of the VCR, as also suggested by other authors (Van den Bulck, 1999).

A. Content experience

Another important content related aspect, also with regard to ‘experience’ as well as to the social dimension, is that unlike watching television, watching video is perceived as an event unto itself. The idea that a movie was something else than just a TV broadcast was also expressed in the Videotorg trial (Ling, 1999). Although video could not be compared to watching a film in a cinema, it was perceived as a special social event. Watching video could be seen as a pseudo-film experience that has developed its own social identity. Ling et al refer to the use of food, the video selection process, the invitation of friends and even the scheduling of time for the session that distinguishes it from normal broadcast TV. (Ling, 1999). This is important for VOD, as this means that people will probably choose on-demand movies in a different way than they choose on-demand programs. This could also have an impact on people’s willingness to pay for VOD. People are already used to pay for movies (video rental, movie theatre), but not for episodes of TV series (Van den Broeck, 2006).

B. Internet: the new challenge

The Internet could be perceived as the absolute video-on-demand system. It enables the users complete control on the three basic dimensions of VOD as mentioned above. Furthermore, the border between television and computer is becoming vague. Television sets are already being used as computers and vice versa. Next to that, we also notice a change in time-consuming activities, especially among youngsters, who are using the Internet more often (TOR, 2004).

Online video, or watching video via the computer, has become a common practice in the last few years. In the US, the majority of the online population (69%) already watched online video (OPA, 2005). It is not only youth that watches online video. The majority of online viewers are male, and the age group between 35-54 accounts for 45% of all online video viewing.

In relation to content, we notice that although the amount of available content on the Internet seems to be unlimited, there are two major differences with traditional TV-viewing:

1. The personal computer is used to watch other content than traditionally watched on TV. News is the most watched genre online, although sports fragments are watched the most frequently. Movie clips and video clips are the second and third most watched genres. Online viewers are particularly interested in original content, exclusive for the Internet and not available on other media as TV en DVD (OPA, 2005; OPA, 2006).
2. Online video should be short, for news, movie clips and sport highlights 1-2 minutes is the ideal length, for music clips 3-5 minutes is preferred (OPA, 2005; OPA, 2006).

But the Internet also has another major challenge in terms of content: user generated content. User generated content is a quite new evolution and is strongly enabled by numerous Web

2.0 applications and services. The most well-known and popular service distributing user-generated content, is Google's You Tube. Each day more than 100 million movies from different genres are being watched via this website only. As within most online communities, also for You Tube the Nielsen principle of 1% of users contributing a lot, 9% contributing a little and 90% only consume content is valid (Markus & Hannu, 2006; Nielsen, 2006).

An important question is how this user generated content will evolve in the future, and which place it will take in existing viewing patterns.

2.2.3. Place dimension

A last dimension, on which on-demand services can have an impact, is the place dimension. For long, television was placed central in the living room, as a gathering point for all family members. This embedded aspect of television in our living room, goes back to the fifties, when the living room was the only room in the house that was heated (Hamill, 2003). Nowadays this is no longer the case.

Today many households have more than one TV-set (29,4% of Belgian households has more than one TV-set; IP, 2005) and television sets can be found all around the house. The multiple TV sets in the house can be found in public as well as in private spaces like children's bedrooms, parents' bedrooms, hobby rooms, and even kitchens and bathrooms. A Flemish research on the use of television in the bedrooms, showed that 30% has a TV-set in the bedroom. This means that our bedroom has a new function, it becomes a place to relax and escape of the stress of the everyday life.⁴ This is also related to changes in experience as well as to the social dimension (see above).

TV-sets are omnipresent in the house, but there is not only a multiplication of TV-sets, also other screens in the house can and are being used to watch video content. The multimedia computers of today in combination with Broadband connectivity make that computer screens can be used as TV screens as well. People can use their computer to watch all kinds of video content (see also above).

As illustrated above, on – demand services provide additional content at any time, expanding the range of programmes that can be watched on the different screens present in the house.

Past research showed that the additional TV-sets in the house were used as an “emergency device”. The best equipped TV-set was still to be found in the living room, but the additional sets were used in so-called emergency situation, for example a football match that only the husband wants to see or for the children. Besides this, most programmes were still watched in the domestic and social context of the living room (Bauwens, 2002).

Although outside the scope of this research, it is also important to recognise that the practice of watching television is also being transferred outside the home. This means that in this ‘new’ mobile society, due to mobile devices, the Internet etc., television seems to be everywhere. More than traditional television sets, mobile television is emphasising on interactivity, including video-on-demand. Research has already showed that this mobile evolution not necessarily means that this is an addition to watching television on a regular TV-set. One of the places where mobile television is being used is precisely in the home. (Södergard, 2003) Next to that, because of the intrinsic capacities of mobile television, new viewing patterns for these devices impose. Question here is to what extent this will influence traditional or existing viewing patterns.

⁴ This is based on a research conducted by Herman Konings, a Belgian trendwatcher who runs the company called nXt (www.nXt.com), for the ‘Sleepy’ company.

The expansion of available channels and content, promises the evolution towards more fragmented viewing practices. An important question in this regard to incorporate in our future research is if television is still able to hold its social character. And how will these additional screens be used in the future? How does the increasing number of potential television screens influence the traditional practice of watching television on the living room television?

3. Conclusion

When looking at the existing user practice of TV-viewing, two elements seem to be of importance: the television dominance and the television experience. The first element refers to the fact that television is domesticated in such a way that it is a major part of our daily life practices, not to say a dominant part. The second element refers to how people experience television. This is influenced by their viewing behaviour, the social dimension as well as the scale of experience of TV-viewing.

When video-on-demand (VOD), (and with that, new kinds of audiovisual content), wants to be fitted in everyday viewing patterns, it has to interact with those two elements. To do so, the three major dimensions on which VOD has an impact have to be taken into account: time, content and place. Video-on-demand after all enables people to see what they want, where they want, at any time.

The environmental scan has also indicated that some very specific elements are important with regard to the domestication of VOD. First on demand services offers people the opportunity to watch the content they want to watch, in a relatively simple manner. A major advantage of the on demand system is that it relates quite well to something people already know (VCR) and more important of which they already have some user experience and practices. Earlier research found that *innovation through familiarity* is important for the uptake of new services or applications. Secondly people want to feel that they are in control. They want to have the option to time -shift and the option to watch specific content when they want it, but this does not mean that they will use it intensively. People like having choice and options, but they are not always willing to use these options actively. The convenience, the comfort and perhaps also the social aspect of TV viewing makes that live-TV is still popular. As in other research on the use of new technology, this is also linked to the idea that *old habits die hard*. People don't change their habits overnight, but there is a gradual shift towards new user practices, as a result from a constant interaction between the user and the technology. Thirdly, we notice an enormous expansion of available content. This has two-sides for users. The increase of content leads to *more choice*, which is something people like. On the other hand, this could also lead to '*choice fatigue*', as people can have too many options and that way loose control. An important role will be for gatekeepers. For television, this will probably be the TV-channels, that give people an indication of the type of content and quality they can expect. For online video, there will probably be a growing need for content aggregators that give people control over the available content.

In order to fully understand the interaction between video-on-demand services and existing viewing practices, many elements, (enablers as well as barriers) still have to be identified. Therefore an important focus of further research should be on the gradual shift in user practices.

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The Dynamics Of User Generated Content: Case Study LommelTV

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Abstract

In the decade where Web 2.0 tools blossom and telecom innovations with support for user generated content are popping up everywhere, user research focusing on key factors of content creation is no longer a luxury. A profound understanding of the user and his motives for content creation is vital to make technological innovations socially successful. This objective will not solely have economic consequences in the world of telecommunications. Social relations are also believed to benefit from these tailor-made applications as they get enriched during the user experience process.

In this paper we will discuss an example of a unique innovation driven by user generated content, namely LommelTV. LommelTV is based on the Alcatel-Lucent ‘MyOwnTV’ application (Alcatel 2006). This is an IPTV application developed by Alcatel-Lucent. It enables people to create their own digital television channel and publish their own content to this channel for others to be viewed. In 2006, the city of Lommel was chosen to trial this application. The citizens of this Belgian city started creating their own television content. The movies and photo slideshows on LommelTV entertain the viewer with community activities, city events, holiday memories and funny footage. A broadband internet connection, a settopbox and a photo- and/or video camera are all it takes to generate content for LommelTV.

In order to generate the optimal user experience a multidisciplinary team consisting of engineers from Alcatel-Lucent and communication sociologists from the University of Leuven supported and investigated the LommelTV user community. Special interest has been given to the process of content generation.

A first round of results shows a diverse usage pattern of LommelTV among the selected citizens. Content analysis of LommelTV and in-depth interviews with all the participants revealed that the process of creating content appears to be a complex one. Based on these research results and the input of extensive field work, a theoretical model was developed,

exploring the psycho-social process of content creation. This model indicates that the reasons for (not) using the application actively do not lie solely in the technical features. Rather, when creating content, users appeal to their own motivation, inspiration and audience perception. These key factors will be discussed thoroughly in this paper as well as the question whether this model is suitable to reveal key factors in other types of applications focusing on user generated content.

Introduction: Understanding User Generated Content

In the last decade we have witnessed the rise of the internet. By the year 2007 the internet has already undergone its first transformation. This transformation is denoted by the term 'web 2.0' (Musser, 2006). Web 2.0 encompasses a set of digital technologies that have led to the rise of the weblog and wiki. This technological progress is inextricably coupled to social innovation. In 1999 Berners-Lee already indicated that the Internet should also be about creating things with other people (Berners-Lee, 1999). Popular web 2.0 services such Flickr and Second Life facilitate collaboration and sharing between users. Consequently, the threshold for non-professional users to create and share all sorts of media content has been drastically lowered. This was initially so for the written text (e.g. blogging) but soon after other audiovisual media followed such as music (e.g. podcasting), photography (e.g. Flickr), and video (e.g. You Tube) (Gillmor, 2004).

As a result, in the decade where Web 2.0 tools blossom and telecom innovations with support for user generated content are rapidly emerging, user research focusing on key factors of content creation is no longer a luxury. A profound understanding of the user and his motives for content creation is vital to make technological innovations socially successful. This objective will not solely have economic consequences in the world of telecommunications. Social relations are also believed to benefit from these tailor-made applications as they get enriched during the user experience process.

Case study LommelTV

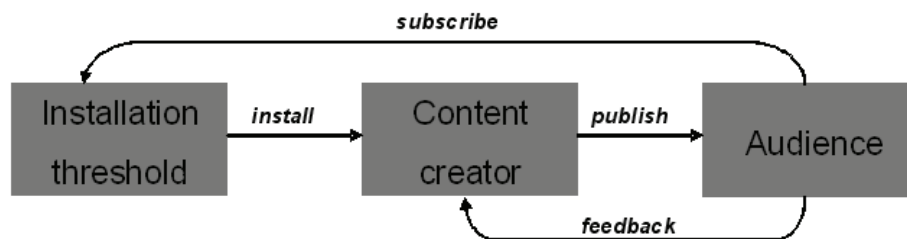
LommelTV is based on the Alcatel-Lucent 'MyOwnTV' application (Alcatel 2006). This is an IPTV application developed by Alcatel-Lucent. It enables people to create their own digital television channel and publish their own content to this channel for others to be viewed. In 2006, the city of Lommel was chosen to trial this application. The citizens of this Belgian city started creating their own television content. The movies and photo slideshows on LommelTV entertain the viewer with community activities, city events, holiday memories and funny footage. A broadband internet connection, a settopbox and a photo- and/or video camera are all it takes to generate content for LommelTV.

A multidisciplinary team consisting of engineers from Alcatel-Lucent and communication sociologists from the University of Leuven supported and investigated the LommelTV user community during the trial period. At the end of August 2006, the research team conducted a first round of interviews with the users of LommelTV in order to get feedback about technical issues as well as societal aspects concerning LommelTV. Each participating community was interviewed separately. The interviews took place in a familiar setting for the users, e.g. a home or in their clubhouse. As of November 1st, sixteen interviews had been completed, totalling 35 persons.

The users' feedback provided the research team with considerable input for adjustments, improvements and recommendations, not only relating to the application but also to the diffusion of LommelTV in the city of Lommel. Gradually, it became clear to the research team which forces were at play in making LommelTV a successful application. It was necessary to map these forces to stay focused on the research questions and take this research to the next level. So this input, together with the field work done between November 2005 and November 2006, was the starting point in the modelling of a psycho-social process of content creation (Fig. 1).

Firstly, a general overview of the model will be given. Thereafter, the key elements of the model are highlighted, followed by several attention points.

Fig. 1: Psycho-social process of content creation



General overview

LommelTV is about generating content, whether or not about Lommel, for an audience in Lommel by people from Lommel. Before a user starts participating in LommelTV, the installation of a settop box is needed. This device allows you to watch LommelTV on your television and provides the login to the web application where movie clips can be uploaded to LommelTV. After a successful installation, the user can start working on his desired content for LommelTV. The process of this content creation is influenced by several factors, motivation being one of them. When the content is ready for publication, the user publishes it to LommelTV, which allows the audience to watch and judge his work. The feedback of the audience will help the user in redefining his next content creation process. Audience that is not yet in possession of a settop box can, at any time, subscribe to LommelTV.

These are the key elements in the psycho-social process of content creation. They constitute the application's general framework. In the next section, each of these elements is further explained in depth starting with the content creator. He/she forms the pivotal element in the psycho-social process.

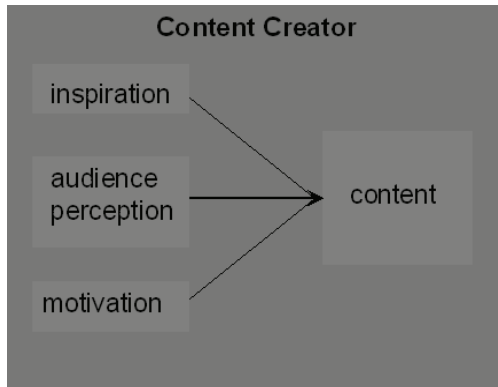
Key elements

Content creator

The process of creating content is a complex one (Fig. 2). A user has to feel inspired as well as motivated to create content he's satisfied with and wants to share with a local public. A motivated user can be stuck in hopelessly seeking inspiration and as a consequence stops generating content. On the other hand, an inspired user who, for instance, does not know how

to edit movie clips, must be motivated enough to master (basic) video editing skills or no content will be created.

Fig. 2: Content creator



Being inspired and motivated are however not the only criteria leading to content creation. The user's perception of his audience is an important additional factor. If you decided to join the project, it's because you want to share your work and have an incentive for reaching out to an audience. The exact size of the audience is at that point irrelevant. Whether the audience of LommelTV consists of 300, 3000 or *only* 30 persons, if the user somehow gets the impression that LommelTV is being viewed and there is an audience to whom he can publish, the content creation process starts. Later on, and only for some types of persons, the exact size of the audience will matter. But even then, it will all be about the user's *perception* of his audience. The application's usage will make it impossible to measure the audience's exact size.

Every time the user has the intention to create content, he will subconsciously check the status of his inspiration and motivation and link this to the thoughts he has about his audience. It may be clear that in this process there are enough elements that can hamper content creation. More details about this can be found under 'attention points'.

Content

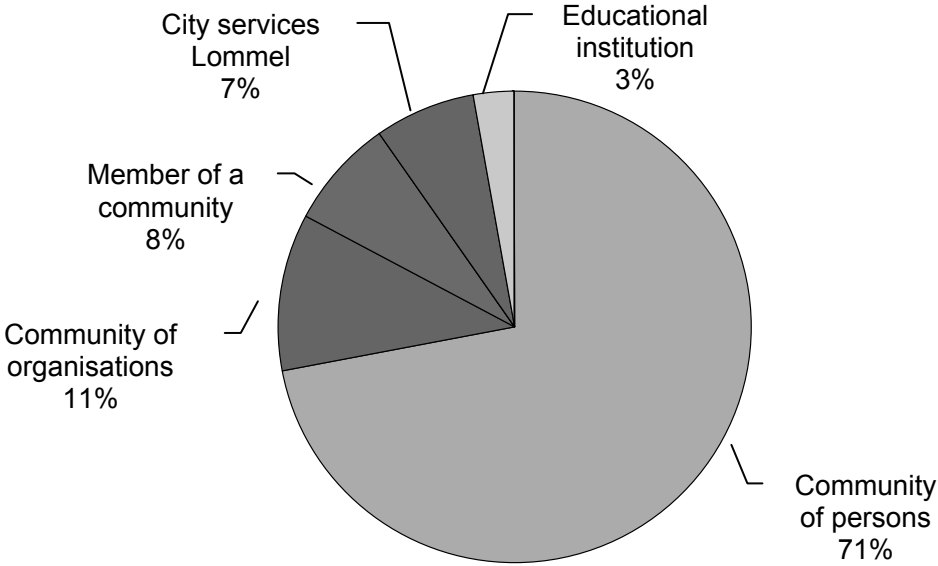
What is the content that can be found on the LommelTV channels? To get an answer to this question a content analysis of the movies on LommelTV was conducted in October 2006. 185 movies, spread over 43 channels and owned by 19 communities, were analysed.

Firstly, there are noticeable differences with regard to the *numbers of movies per community*. Bruudruuster, a multimedia community whose main activity consists of making pictures and movies of parties and events, is taking the lead with 58 movies. DALO, an athletics club, is in second place (22 movies). LOC, the entrepreneurs club of Lommel, is third with 14 movies on Lommel TV. The administrator of both the Dalo and LOC channel is the same person.

Analysing the movies in relation to the type of communities that are the *owners of the channels*, we observe a superiority of 71% for 'communities of persons'. This implies that 133 of the 185 movies are the property of communities of individuals. Communities that consist of organisations, e.g. LOC, represent 11%. 7% of all the LommelTV-movies are owned by the city services of Lommel, while educational institutions are the owners of only

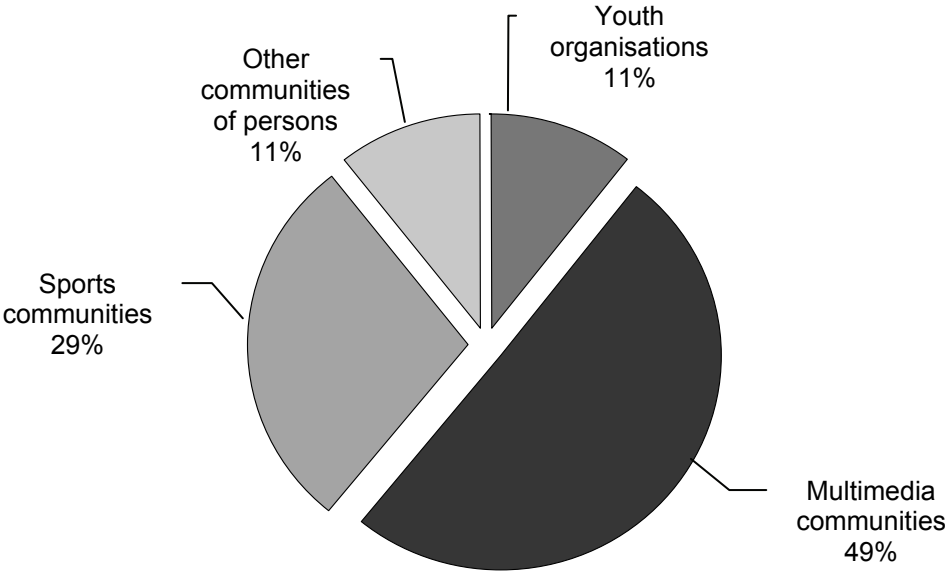
3%. 8% of the movies are more personal and are owned by a member of a community. These movies deal for example with personal hobbies, personal activities with friends or family...

Fig. 3: Percentage of movies in relation to channel owners



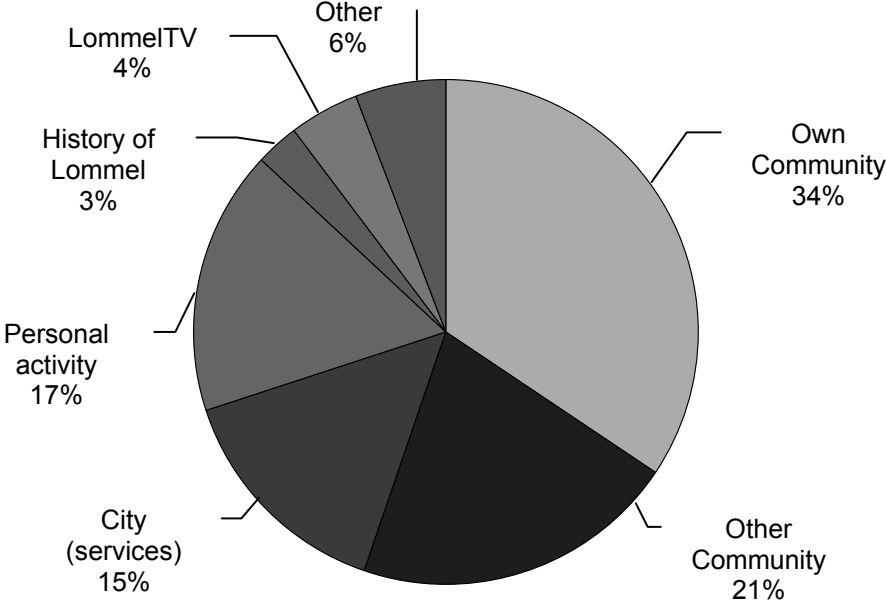
The segment of ‘communities of persons’ can be divided in subgroups. Almost half of them are multimedia communities (49%). These are communities that work with video, photography, computers... Sports clubs represent 29% of all ‘communities of persons’, while 11% of the movies that are made by a community of persons are owned by a youth organisation.

Fig. 4: Division of Community of Persons



The content of LommelTV was analysed on two levels. First of all we examined the *type of activity* that was covered in the movies. 34% of all the movies concerned an activity of the own community. Furthermore, the communities like making movies about activities of other communities as well (21%). 15% of the LommelTV movies are about Lommel or about city services and 3% deal with the history of Lommel. Personal activities form a segment of 17%. LommelTV itself is the theme of 4% of all the movies

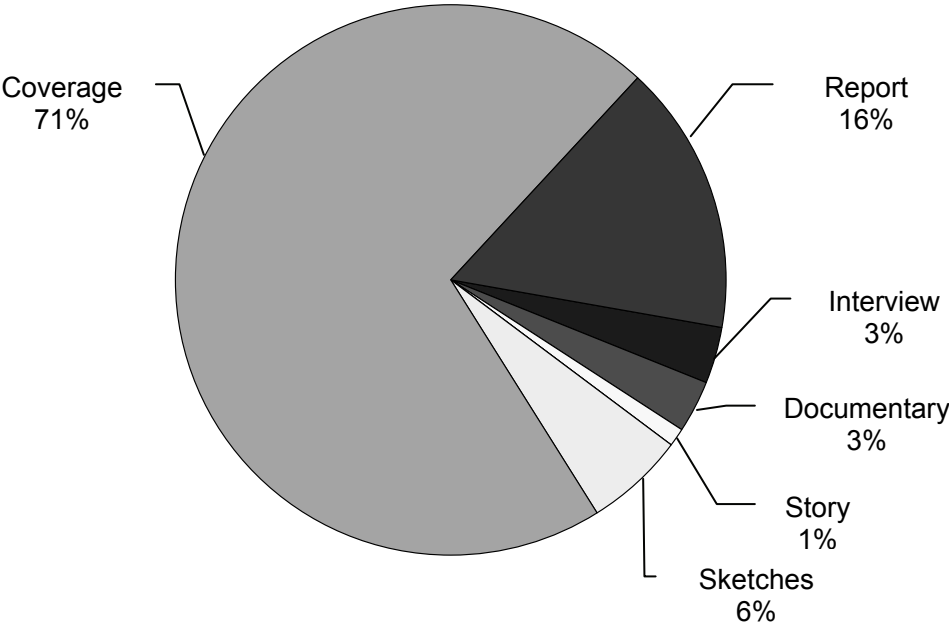
Fig. 5: Type of activity covered



The second level on which we analysed the content of LommelTV, are the *movie themes*. Per movie, one or two themes were indicated. Table 2 represents the top 10 of the themes that occurred the most. Sports are clearly the most popular on LommelTV (55 of 185 movies). The second most popular theme is music, which occurs in 22 of 185 movies.

When we look at the *formats* that are used on LommelTV, we notice an enormous dominance of the coverage format (71%). 16% of the movies are reports, which are coverage's with a reporter, and can include an interview. Interviews themselves, as well as documentaries, concern only 3%. Fiction is not very popular on LommelTV: only 1% of all the movies are stories and 6% are sketches.

Fig. 6: LommelTV formats



The *tone of the movies* on LommelTV corresponds to the used formats. The greatest part (66%) of the movies is informative. With 32%, the entertaining movies make the second big part. Expressive and persuasive movies include just 1%. With regard to humour, we can see that 12% of the LommelTV movies are humoristic. These movies are especially entertaining and to a much lesser extend persuasive and informative.

Fig. 7: Tone of the movies

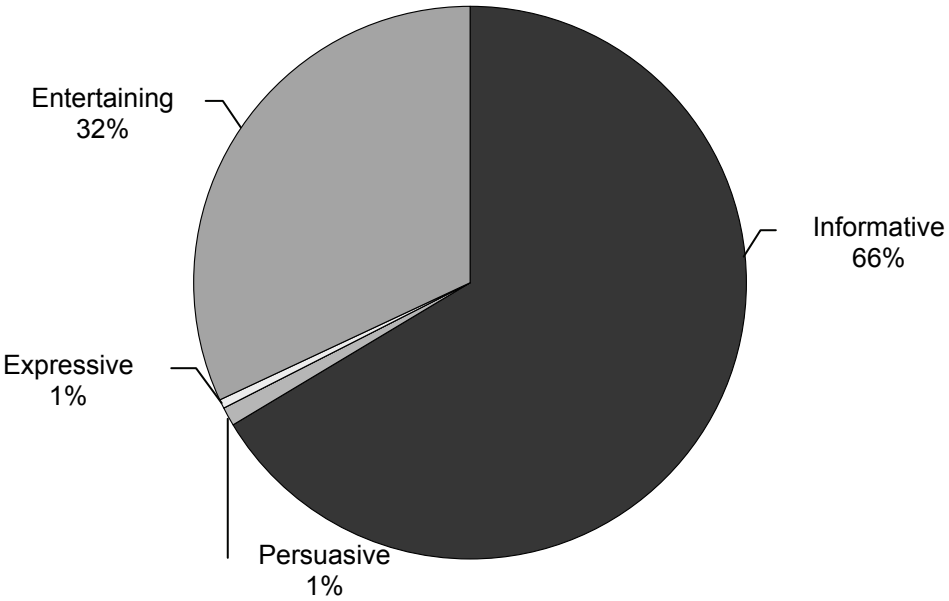
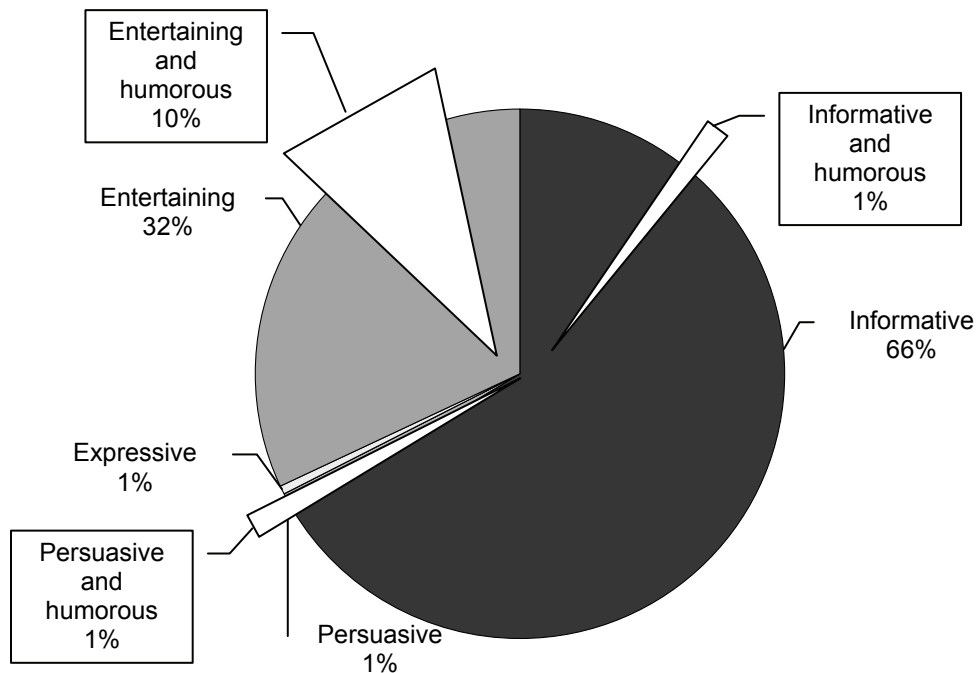


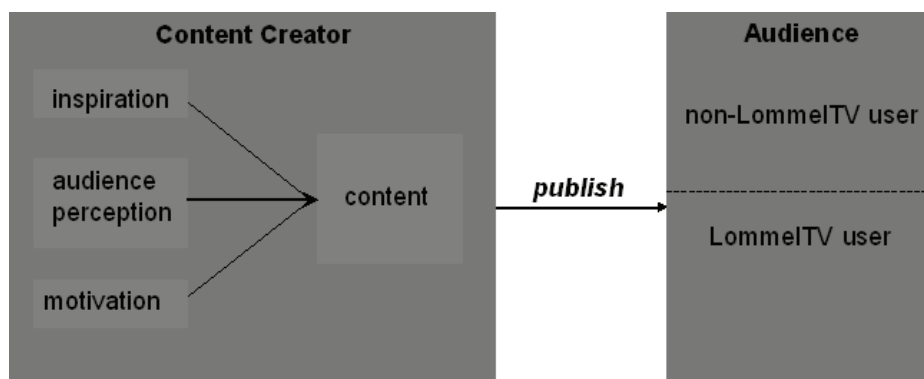
Fig. 8: Tone of the movies (humorous)



Audience

After the content creator has made his content ready for publication through footage editing, he publishes it on LommelTV. From that point onwards the audience of LommelTV is able to watch it on television (Fig. 9). But what is LommelTV’s audience? And can it be the same audience as the one perceived by the content creator?

Fig. 9: Audience



A part of the audience of LommelTV can be defined by users of LommelTV and their viewing habits. On the other hand, there is a part of the audience that can not be exactly measured: the non-LommelTV user.

Non-LommelTV user

There are two kinds of non-LommelTV users who complete the audience: friends and family of the LommelTV user or other members of the community and people at public spaces where LommelTV can be watched. The first group of viewers is relatively small. They watch LommelTV once or twice due to curiosity but they are no candidate for having a personal settop box at their own home. A possible motive behind this lies in their perception of absence of a possible audience consisting of non-LommelTV users.

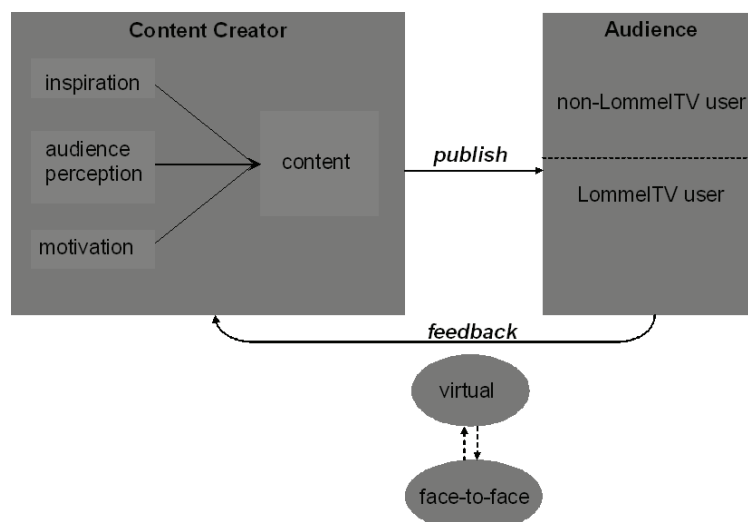
How can non-LommelTV users, who have no connection to LommelTV users, watch LommelTV? After the public launch of the research project in May 2006, four public places opened their doors for the citizens of Lommel to come and watch LommelTV: the city hall, the library, a museum (Museum Kempenland) and the cafeteria of the elderly home. It is impossible to predict how many people have passed by these televisions since and caught a glimpse of LommelTV or stood still for a minute and watched some movie clips. However, it became clear that the impact of these places is rather small. Their role and tactics needs to be reviewed. These places are not very inviting to watch television and do not appeal to the imagination of the content creators as places where their movie clips can be watched and appreciated. In this context, a compilation of the best movie clips on LommelTV was put on DVD and is, for now, distributed to the event hall, the waiting room of a doctor and a restaurant. A variety of public places is thus gradually established. A further expansion of public places is put on the agenda.

It is especially the unknown presence of these non-LommelTV users at public places that influences and forms the audience perception of the content creators. This problem will be discussed in the ‘attention points’.

Audience Feedback

The positive power of the audience lies in the possibility of giving feedback to the content creator. And that is what the content creator ultimately seeks and drives: comments on his work, so he will know if he is on the right track or has to make adjustments in his content creation method.

Fig. 10: Audience Feedback



We can distinguish two kinds of audience feedback: virtual and face-to-face. Ratings once or twice a month and a counter on each movie clip are examples of virtual feedback. These are hard facts: how many times has my movie clip been watched; where do I stand in the top 10 of most watched movie clips; who are my ‘rivals’? This kind of feedback influences the user in his next content creation process. For example, he can find inspiration in the themes of three most wanted movie clips. He can be inspired to do better than his rivals. The audience perception of the content creator will benefit from receiving this kind of feedback.

The audience is, of course, also able to give face-to-face feedback. The LommelTV users can do this at the monthly meeting of the LommelTV council. This is a meeting place for all the LommelTV users where problems and initiatives concerning LommelTV are discussed. It is of course also possible for both the LommelTV users and the non-LommelTV users to encounter each other on the street or at events and give feedback on their work. For the moment, coincidence has to be on your side however to meet the right persons at the right places.

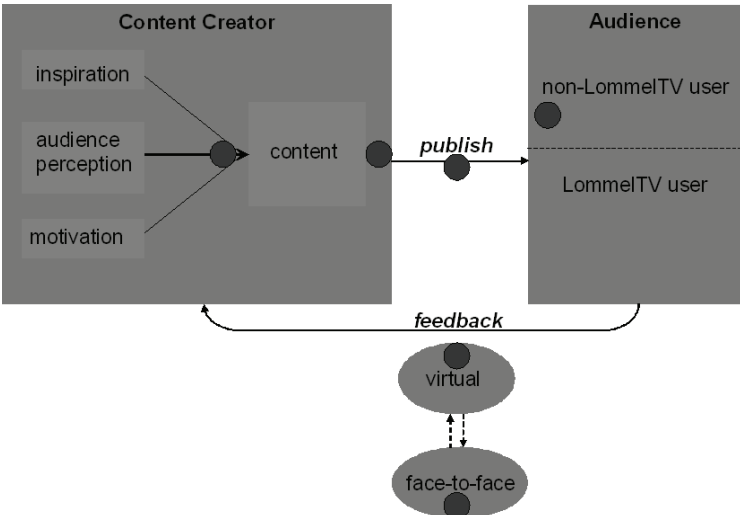
Face-to-face feedback will also have an effect on the user’s content creation process. As already mentioned: whether the audience of LommelTV consists of 300, 3000 or *only* 30 persons, if a few people address a user on the street and say “Nice work”, then he gets what he needs to continue LommelTV and his audience perception has improved.

This key element of the model has also some attention points which will be discussed in the next section.

Attention points

For every key element in the model, the research team has placed attention points to stress out current issues and opportunities of LommelTV (Fig. 11). These points have surfaced during fieldwork, at the LommelTV councils and in the feedback interviews. It is input from the users themselves. Each attention point will be explained and illustrated by one or more fragments of the feedback interviews.

Fig. 11: Attention points



Before content creation

Three psycho-social processes are at play before a participant decides to make content for LommelTV and before a user goes for the next round of content creation. A clear inspiration and (internal as well as external) motivation is necessary.

“If it is being commercialized, and it would stay the way it is, then you are a part of it from the very beginning. Imagine that this would happen within two years, we will have already a lot of content. When you have to start from scratch and make the first movie, at that time we will have like fifty movies.”

Becoming an innovator is a driving factor for some of the users of LommelTV. For a larger group of users, the motivation for participating in LommelTV is promoting their community.

“That is the only reason why I participate in the project [promoting our community]. If it is purely community TV in Lommel, and if it stays a labyrinth like today, then it is not worth it. There has to be a more obvious structure. Now the names of the channels are chosen voluntary, we are also wrong about that.”

Feeling inspired and motivated is not always enough to start creating content. Why put all your effort and time in creating some content when, in your perception, no one can watch it?

“LommelTV is a nice initiative but why would we publish our work on it if no one can see and judge it, except the 30 users? People do not go to the city hall to watch LommelTV. Furthermore, it is a place for the elite.”

Having the perception that there is no audience out there is a major obstacle in the content creation process and needs to be given full attention by the research team in order to convince already inspired and motivated people to start generating content.

After content creation, before publishing

It seems a logical process: after a user has made his content, he can not wait to publish it on LommelTV. This is rather different in the field. There are users who consider the quality of their movie clips as an important factor, technically as well as content-wise. In some cases, this will lead to a form of self-censorship:

“Because there are only 50 users right now, you impose censorship on yourself. You think it is not good enough for LommelTV, you look at what is missing on LommelTV, so you can try to do it yourself. There are users who do not impose censorship on themselves and just do their thing. When their movie is uploaded, they are very proud of themselves, because everything you do yourself is always very good. I impose censorship on myself, not that it is not allowed, but that the movie is not good enough, e.g. the music. It is the same as on the internet, when I design a website I make sure there are no spelling mistakes for instance. It is a tendency I have.”

Publishing

Once a user is satisfied with the way his content looks, he is ready to publish it on LommelTV. Problems that can occur at that moment are mainly of a technical nature. The process of encoding and uploading the movie clips takes a lot of time, after the user has

already put a fair amount of time into editing the movie clips. This may in turn have an impact on his motivation.

Audience of non-LommelTV user

Content creators need an audience. An audience will give them feedback and that feedback will help them to improve, alter or even remove their content. Even if they all have a perception of the audience that does not match reality, they need to know that there is at least a potential audience. From the point of view of the research project, one can ask: why ask people to make content for a digital local television channel if the majority of the citizens is left out?

This problem was pointed out by a number of users:

User: "The problem for the non-participants is that they have to go to a place or room provided with a settopbox. It would be a lot easier if it is possible to watch it on the internet."

Interviewer: "Would you rather watch it on your pc?"

User: "Not me, but I can imagine that this is interesting for the public."

Interviewer: "Imagine that every citizen of Lommel can watch LommelTV, what would be the big advantage of this expansion?"

User: "More people will be interested in LommelTV that is what is going to happen. If you talk about LommelTV to others, you will easier find someone who understands what you are saying. This is not the case right now, because there are not enough people involved. You still have to promote it to the public."

This attention point is a crucial one: not only can an absence of audience discourage the current users in generating content; ignorance of LommelTV in the daily life of citizens will inhibit new candidates to participate in LommelTV.

Feedback

If users reach out to an audience, that audience needs to have the means to fulfil its powerful role: providing feedback. Concerning the virtual feedback, these means are technical. Up until now, only ratings are available as virtual feedback. First they appeared on a monthly basis on the public section of the website of LommelTV, now they are put, also monthly, in the private section that is only accessible by users.

"It should also keep you motivated. For example, ratings keep you motivated. When the ratings are published, you know at short notice which movies are interesting. Maybe ratings after two weeks are more interesting because you can anticipate faster. I would insist that the ratings are automatically generated."

There is a need to generate extra technical features that give feedback to the users. For example, a counter of the number of views on each movie clip is desired by most users.

Concerning the face-to-face feedback, it is clear that only a small group of users consider the LommelTV council as a meeting place between the users. The majority of users find the council a useful instrument in the research project, but do not feel the need to participate in it. One of the outcomes of the council is the initiative to organise a public screening event in Lommel. On an evening in December, citizens of Lommel are invited to watch short movies

about their city, whereby movie clips of LommelTV will also be shown. This will be a good moment for the users to get in touch with the public, receive feedback on their work and adjust their audience perception.

Installation threshold

The last attention point is situated at the start of the psycho-social process of content creation: the installation threshold (Fig. 1). Although a number of people do not encounter any problems during set top box installation time, others are confronted with a series of installation issues. The preconditions of having internet close to the television and an internet connection that is fast enough are major obstacles related to the installation. This has without a doubt an influence on the motivation of the LommelTV aspirant user. Although a manual is provided, the concept of *do it yourself installation* is not quite successful. More technical support during the installation process should be provided.

Conclusion

As a general remark we can state that the technical component of the application is a key facilitating element. However, the thriving forces behind these technicalities are the people participating in content creation. It is of crucial importance to keep them motivated and inspired throughout the development process. This may prove a greater challenge than the application's technical evolution.

Furthermore, in order to have a diverse set of people participating in the process of content creation it is pivotal to target technical as well as societal lead users. The latter possess a large social network complemented by a canny ability to motivate newcomers to have a go at content creation, without necessarily being technically savvy. This then implies the necessity of organising a series of workshops explaining how to film, edit and write a storyline.

Different initiatives should also provide visibility to a communityTV project. In this case the old-fashioned way of word-of-mouth is still a highly effective form of diffusion. When people are excited about using an application they are more likely to involve peers into the project.

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From Simple Customer To Warm End-User; Or, How To Organize The Maintenance Of A Wi-Fi Community Innovation?

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Abstract

This paper arises from an ongoing PhD research project exploring the dynamics of user-initiated community innovations in the domain of ICT networks. It builds on a case-study on a Dutch Wi-Fi community innovation called *Wireless Leiden* (WL). WL is a wireless networking infrastructure, collectively created as a ‘communicative assemblage’ of cheap consumer Wi-Fi devices, home-built antennas, reconfigured open source software and an ‘army’ of volunteers.

As the innovation is produced by a grassroots, bottom-up, hobby community it is lacking financial resources for repair or service labor. I thus raise the following central question: How is support of users and maintenance of technology organized and arranged within community innovation such as Wi-Fi community networks?

The argument developed, is that community innovations can only succeed by creating a socio-technical ‘infrastructure of support’. Furthermore, stabilization of this Wi-Fi community innovation can be understood as the successful mobilization of local residential end-users willing to perform maintenance work. To capture this new role for end-users, I introduce the *warm end-user* concept modeled after the *warm expert* (Bakardjieva 2005). Whereas warm experts help inexperienced users to properly connect to network technologies, warm end-users help novel technologies to properly connect to user communities.

Key words: Community innovation, Wi-Fi, maintenance work, warm expert, warm end-user

§1 Introduction: Wireless Leiden as community innovation

The central focus of this paper is the organization of maintenance of community innovations. In order to be able to address such a general topic, this paper builds on a specific case-study, part of a larger PhD project on ICT community innovations. Because of space constraints I refrain from an in-depth exploration of the concept of community innovation (for an introduction see Van Oost, Verhaegh and Oudshoorn forthcoming). However, in short one could say that in community innovations, the community and the innovation cannot be separated from each other. The community’s central focus is the technology (hence a ‘technical community’) whereas the technology is fully produced by the community (hence a ‘community technology’). Community innovations are initiated and driven by users, volunteers, hobbyists, tinkerers, enthusiasts, amateurs or ‘pro-ams’ (Leadbeater 2004) all sharing a primarily non-financial motivation for participation. When asked why they are involved in the collective creation of complicated technical systems (such as operating systems consisting of million lines of code) and huge undertakings (such as writing a free online encyclopedia with millions of lemmas) commons answers are ‘because it is fun to

solve technical puzzles’, ‘because it is important to create stuff that is accessible for everyone’, or ‘because I can learn a lot and develop my skills’.

The interesting empirical finding is that there are many instances of grassroots, bottom-up, initiatives out of which a complete ‘community innovation system’ emerged that ‘works’ in the sense that they grew into massive undertakings that are able to handle *all phases* of the innovation process from idea to prototype to manufacturing, distribution and service and support. What is especially remarkable is that resources in the form of financial budgets to pay for personnel and tools are usually lacking. The question then becomes how the necessary maintenance work of the technology is organized and arranged by the community itself. This is an especially interesting question, because the ‘users as sources of innovation’ literature is currently mainly concerned with the free circulation of information, instead of the blood, sweat and tears of the hard work to not only invent and build community innovations, but to keep them working over a prolonged time. The explicit focus on maintenance work can be seen within the tradition that stresses the importance of ‘invisible work’. This research strand foregrounds actors originally deemed unimportant (such as secretaries, housewives, nurses, call center ‘reps’ or technicians), by further investigating their essential roles in keeping complex systems working (for example see Shapin 1989; Star 1991, Oudshoorn 2006).

To be able to capture the ‘invisible’ work to get and keep a community innovation working, a case where interaction with physical devices (instead of more virtual artifacts such as software) could be studied was chosen, in this case Wi-Fi technology. Recently, publications have started to explore the emerging phenomenon of Wi-Fi community initiatives (Rheingold 2002, chapter 6; Rao and Parikh 2003; Medosch 2004) or the innovative use practices of Wi-Fi (Escudero-Pascual 2003). However, only Sandvig (2004) focused explicitly on community Wi-Fi as a locus for “diffusion, experimentation, innovation, popularization, and the provision of new features and services”. In my research project, I choose the approach of an explorative, in-depth case study (Yin 1984) because no previous literature described the dynamics of emerging Wi-Fi community initiatives.

In order to improve reliability of the results, triangulation of empirical data was obtained by harvesting different sources (Eisenhardt 1989), while ‘following the actors’ (Latour 1987) both online as well as offline. First, I explored the publicly accessible Wireless Leiden website, wiki and repository ([http://\[www; wiki; svn\].wirelessleiden.nl](http://[www; wiki; svn].wirelessleiden.nl)). This site proved to be a tremendously rich source, as – in the traditions of open source communities – full transparency is strived for at both material as well as organizational aspects. Minutes of meetings, discussions and debates were made available online in addition to technical descriptions, guidelines and images. Second, I explored the members-only archives of the volunteer mailing list. Third, I held in-depth interviews with different actors ranging from core initiators of WL to peripheral end-users. Fourth, I visited WL meetings between January 2005 and April 2007. At these meetings I observed discussions, presentations and workshops and I interviewed additional participants. Fifth, homes of people connected to WL were visited to get an idea of specific domestic WL configurations.

Before we can focus on maintenance, first let us have a look at what the Wireless Leiden Wi-Fi innovation actually beholds?

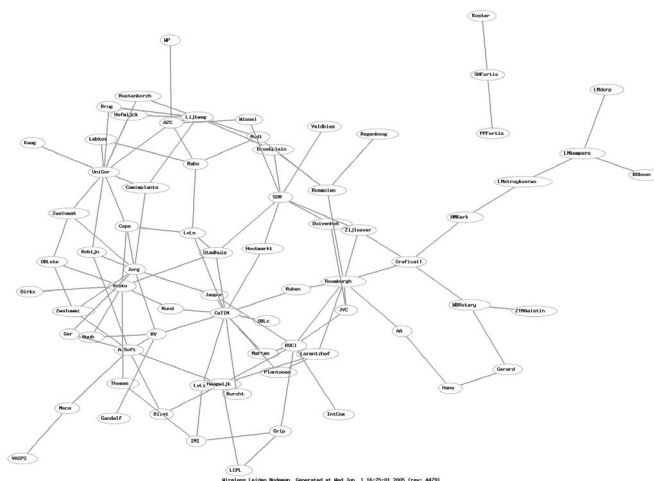
A tentative anatomy of Wireless Leiden

When I started my research on the WL case study in 2005, one of the first questions I was struggling with, was a seemingly rather simple one: what is WL? My first attempt was trying to reduce it to the technological infrastructure by stripping away all the human elements. This approach suits the common-sense thinking of infrastructures best, or as Star and Ruhleder (1996, 112) write:

“Common metaphors present infrastructures as a substrate: something upon which something else ‘runs’ or ‘operates’, such as a system of railroad tracks upon which rail cars run. This image presents an infrastructure as something that is built and maintained, and which then sinks into an invisible background.”

Conforming to this image then would be the image of technical diagrams or pictures of artifacts stripped of human involvement. For an example of such a depiction of Wireless Leiden see fig. 1 giving a schematic topology of the infrastructure.

Fig. 1. Wireless Leiden infrastructure: every circle is a Wi-Fi node functioning as an omni-directional ‘access point’ and the lines in-between are point-to-point ‘backbone’ connections.



(source: Wireless Leiden website)

The ‘technological’ part of WL entails a completely wireless backbone computer network. This technological innovation is based on translating consumer-grade commercial-off-the-shelf indoor, short-range, cable-replacing Wi-Fi devices into a dedicated, weatherproof, outdoor, long-range wireless networking infrastructure. The main principle of the network is that where normally the ‘backbone’ of a computer network is provided by expensive underground glass fiber or by commercially licensed microwave ‘backhauls’, WL uses cheap Wi-Fi devices in a free unlicensed part of the radio spectrum. For those interested in the technological intricacies, I refer to the original WL whitepaper on its precise configuration (Van Drunen et al 2003).

However, there are two problems with the approach of reduction to technological infrastructure. First, it strips WL exactly of the social ‘people’ part that is necessary in order to understand how the infrastructure could be built and maintained. Second: the infrastructure does not sink into the background, because for many people their direct and active involvement with the infrastructure as a goal in itself is the primary motivation for their participation.

My second approach to understand the WL Wi-Fi innovation focused explicitly on the people part that makes the difference between WL and a ‘regular’ commercial computer network. A cross-section of the WL volunteer community is given by the photograph in figure three, taken during one of the many get-togethers. However, looking at the case exclusively from the people point of view, nothing really interesting shows up; just a bunch of people having a drink while chit chatting about their technical hobby.

Fig. 2. Wireless Leiden community: coffee break during meeting in local community centre (Leiden, 2 November 200).



(source: website Wireless Leiden)

When we start to follow the different actors, interesting patterns surface. The ‘social’ part of the WL innovation consists of the mobilization of the local Leiden community as a commons providing resources for the development of this infrastructure. This is realized by volunteers pooling their time, energy, expertise and money to realize an infrastructure that could normally only be produced by professional companies or governments. The innovative aspect of this process is that the WL community seemed able to transcend the traditional characteristics of a ‘technical hobby community’.

Haring (2007) introduces the notion of technical hobby communities related to her research on the technical culture of American radio amateurs from the 1930s to 1970s. She describes these men as precursors to the group of computer hackers that would emerge somewhere in the seventies and then with the advent of the Internet grow increasingly larger. However what is characteristic for these technical hobby communities is that the boundaries of their social group are quite clear in the sense that you either are a technical hobbyist, and therefore group member, or you are not. The community homogeneously consists of ‘hobbyists’ who all own the ‘type X’ device which is at the heart of the hobbyists interests (e.g. radio, or motorcycles or computers).

Following this line of thought, WL consists of an enthusiastic group of people with a passion for tinkering with computers and wireless devices, working towards realizing their shared goal of building a local wireless computer network. Initially there was no formal organization, just enthusiasts meeting each other in the evenings in their homes to collectively engage in some ‘Wi-Fi hacking’. The collective tinkering with technology by solving practical engineering puzzles while simultaneously drinking some beers provided a means for creating a shared identity as well as a sense of belonging to a social group of local ‘computer enthusiasts’. So we can understand WL in its infancy as a technical hobby community, of

which there are many more examples such as automobile or motorcycle enthusiast, radio amateurs, radio-controlled miniature airplane hobbyists or more generally ‘brand Y’ or ‘type X’ device user groups.

However what sets apart the WL case in the first place is that although the initiative started as a close group of tinkerers with a strong interest in Wi-Fi technology, from the onset on the group consisted of people with increasingly diverse backgrounds. In the very first beginning, from 2001 onwards, the WL group could be described as a mixture between those with an interest in computers combined with people with an interest in radio. What they shared was an interest in using technology to create digital communication networks over which all types of information in the form of zeros and ones could be transmitted. Admittedly, the focus is still technology, and the cross-over between ham radio amateurs and computer hackers is also not entirely new, as already described by Haring (2007) amongst others. However, although technology itself is still seen as an important topic, for the WL project to succeed as a whole, many more ‘softer’ social skills and expertise are becoming increasingly important, such as dealing with the press, interesting sponsors, assisting end-users, organizing volunteers, etc. In the second place, what sets apart WL from a ‘standard’ technical hobby community is the strategy to actively include non-expert people with no interest in the technology itself, but the possibilities these technologies open up. In the WL case the initiators came up with the ‘free Internet’ carrot to seduce people to connect to the WL infrastructure. This way Wi-Fi no longer had to be seen as an interesting goal in it self, but rather as a means for accomplishing other uses such as obtaining free access to a fast connection to the World Wide Web.

Wireless Leiden as a community-network

By now, I have reached the conclusion that Wireless Leiden is best conceived as a kind of a ‘hybrid’ or a ‘chimera’. What makes this case so interesting as an example is the fact that we can neither reduce WL to a ‘technical’ infrastructure (such as those built by telecommunications companies) nor to a ‘social’ hobby community with or without formal organization structure (such as local ham radio chapters or sports clubs) without losing what makes WL so innovative. The ‘technical’ infrastructure of a wirelessly connected broadband computer network is what keeps the WL community together by focusing interests and goals (analogous to how open source software communities function). However simultaneously without the social community of people that feel that tinkering with Wi-Fi under the umbrella of WL is part of their identity and obtain a ‘sense of belonging’ from being part of a community of creative do-it-yourself technical enthusiast, the technical infrastructure would quickly decay into a non-working state. In this sense the direct messages sent between volunteers when they drink a beer together are equally important for the ‘correct’ functioning of the network as digital data packages sent between different Wi-Fi nodes.

In relation to this servicing of a ‘public’ the members of the WL community can be seen as a kind of socio-technical ‘bricoleurs’ (Lévi-Strauss 1968) creating a local Leiden ‘communicative assemblage’ (Slater 2006). Currently, the WL community innovation consists of a broadband Wi-Fi ‘freenet’ (“Wireless Leiden”) made up of 69 Wi-Fi nodes, around 90 volunteers, free access to the World Wide Web (sponsored by a commercial ISP) and a few thousand Leiden citizens using WL to mainly browse the web and e-mail. The exact number of end-users is unknown because access is ‘free’ and an ‘official’ registration procedure is lacking.

In the case of community innovation both people and technology are ‘fluid’ and exactly this ‘fluidity’ instead of stabilized black boxes creates the possibility for a sustainable state of the ‘network’ as a whole (De Laet and Mol 2000). Where Latour describes the construction of ‘immutable mobiles’ in order to obtain ‘stabilization’, I will argue that in community innovations a sustainable degree of stability is actually obtained by keeping things open in a fluid manner. This fluidity through openness as organizing principle is visible in many different places. In this sense the fact that end-users are expected to actively engage with both the ‘WL community’ as well as the ‘WL technology’ is what creates the surplus value to choose for the ‘community innovation’ and not for an analogous commercial alternative.

The interesting thing is that this main organizing principle can be found both in the inner workings of the ‘community’ as well as in the inner workings of the ‘technology’. The network as a whole consists of a whole of more or less loosely coupled elements which together make up the actor-network. In this sense nobody has a ‘complete’ overview of the ‘network’. Depending on the position of the actor in the network the perspective causes another view. For end-users trying to connect to WL for the ‘free’ internet the network looks completely different than for the programmer located in Boston who as part of his after-work relaxation is tinkering with the optimization of the routing algorithm in the obscure OCaml computer language.

In traditional actor-network literature there is always the implicit notion of the Machiavellian ‘project champion’ who as a spider in the web is controlling/seducing all the surrounding actors to do exactly as he (because it is almost always a male protagonist) has planned. Although politics and conflicts play an equally important role in community innovations, the centre of gravity is not lying in the centre, but it is distributed over many local small centers that constantly fluctuate in relevance. When I first approached WL volunteers in 2005 I asked them to sketch out the organization structure. What I had expected them to do was to sketch a small inner circle of ‘enthusiastic experts’ surrounded by a larger circle representing a group of less technically skilled ‘volunteers’. However, most participants came up with several small circles of which some interconnected, while others were not. Communication between the different groups was sometimes completely ad-hoc, and sometimes heavily structured. However, according to those involved firstly there was no ‘whole’ representing the complete Wireless Leiden, and secondly there was neither ‘centre’ nor ‘periphery’. Admittedly some people were more skilled towards the technical spectrum; however those with good social skills were also broadly regarded as delivering equally important contributions. Most highly regarded were those who could navigate through technological and social challenges simultaneously, or as one of the participants said: “We have some people that can play chess many different levels at the time, and these people are the ones who really bring this project further.”

Fig. 3. Interfacing the technical with the social and the individual with the collective: domesticating Wi-Fi by a WL volunteer who locates this new technology on top of his house rather than within it.



(source: WL website, 2004)

§2 Framing maintenance within ‘infrastructures of support’

Von Hippel termed the nexus of information exchange between those interested in doing so an ‘innovation community’ (2005). Central to his concept then is the focus on the innovation community as a locus for the exchange of information. However the main point of this article will be that in order for this exchange of information can take place, an underlying infrastructure is necessary. This infrastructure is not an infrastructure in the purely technical sense, but a ‘infrastructure of support’ which can best be understood in the case of community innovations as a socio-technical ‘assemblage’. In order to further work out the ‘infrastructure of support’ I built on the work of Leigh Star on infrastructures, Paul Ceruzzi who introduced the term in the first place and Don Slater (2006) who described ‘communicative assemblages’ which function as a telecommunications infrastructure that is not only made up of high-tech telecom technology, but also of people traveling cheap busses on muddy dirt-tracks.

In this section I frame innovations as socio-technical systems that cannot function without maintenance networks. In order to be able to understand how Wireless Leiden organizes its network of maintenance we take a short detour along some theoretical literature helping us better understand the role of maintenance in relation to the emergence of innovations.

Social worlds configuring collective creativity

A common sense thing to do when we think about the origin of creativity is refer to stereotypes such as the ‘secluded genius’ who through ‘divine inspiration’ creates a work of true art in the same way as an Aeolian harp plays music fertilized by the (Greek god of the) wind. However, a richer understanding of creating novelties - irregardless if we call them ‘works of art’, ‘scientific facts’, ‘technological artifacts’ or ‘quick and dirty hacks’ - is possible when we shift the unit of analysis from the individual to that of the social collective.

Becker’s seminal ‘art worlds’ (1982) is an illuminating instance of the richness of the ‘social worlds’ perspective originally developed by the Chicago School of Sociology. In his work

Becker describes how artists are ‘configured’ by the support that surrounds them. Artists’ possibilities for translating their creative potential into concrete works is enabled as well as constrained by the ‘art world’ in which they are confined. This means that artists have to live up to social as well as practical conventions in order for their work to be appreciated by the public. For instance, theoretically a composer could compose an eleven hour concerto. However in practice the play’s length would cause severe practical problems lowering the chances of actual performance by an orchestra to almost zero. The same holds true for a painter who creates hugely sized works unable to fit a museum’s entrance; or a sculptor creating a statue so heavy his gallery would literally be unable to support his work due to chances of it falling through the floor.

Although this paper’s empirical ‘Wi-Fi networking’ domain is different from Becker’s ‘art worlds’, on a more general level a fruitful comparison can be made, namely in respect to the distributed nature of collective creativity and its dependence on infrastructures of support. More banal, just as writers depend on others to provide them with typewriters and papers to express their creativity, and most painters nowadays use ready-made paint, brushes and canvas, the same holds true of the user-innovators in this Wireless Leiden case, whose creative appropriation is based on the availability of commercial-off-the-shelves Wi-Fi devices. The commonality between Becker’s artists and Wi-Fi enthusiasts is that their creativity can best be understood as a collective endeavor.

Infrastructures of support

Let us refocus on ICT again. A more applicable comparison than can enlighten the relation between ICT innovations and users arranging support is offered by historian of technology Paul Ceruzzi. Ceruzzi (1996) describes the personal computing ‘revolution’, which in his analysis could only emerge because of convergence between interactive conversation computer systems and increasingly powerful computer chips. However without the emergence of a parallel ‘infrastructure of support’ next to the technological trends of interactivity and miniaturization these trajectories would not have converged.

“Here is where the electronics hobbyists, cousins of the pocket calculator aficionados, come in. This community had a long history of technical innovation [...] This group supplied the key component needed to make the transition from the microprocessor to the personal computer; an infrastructure of support that neither the minicomputer companies nor the chip makers could provide. [...] Selling a computer for less than 400\$ meant that the extensive support and infrastructure that mini and mainframe companies supplied had to come from elsewhere. For personal computer owners, it came from user’s groups [...], informal newsletters, commercial magazines, local clubs, conventions--even retail stores.” (Ceruzzi 1996, 17-19).

Although Ceruzzi nowhere mentions the term community innovation, I read his account of the origins of personal computing as a distributed community innovation. The ‘infrastructure of support’ Ceruzzi writes consists of a ‘technical hobby community’ (Haring 2007) which would professionalize into a complete ‘support industry’ in the form of computer clubs, magazines, newsletters and conferences.

By defining an ‘infrastructure of support’ as something consisting of humans, Ceruzzi seamlessly fits into the tradition that understands infrastructure analytically as “a relational property, not as a thing stripped of use” and as something that is “part of human organization”

(Star & Ruhleder 1996, 113). Lindsay (2003) also writes about the phenomenon of users who provide their own infrastructure of support in the case of vintage TRS-80 personal computer users. In her study of users who through the Internet create a community taking over maintenance and support roles when the original manufacturer Tandy abandoned its own creations. Not only does the community as a whole provide support for other TRS-80 users, they also take over maintenance activities and even provide spare parts and repair services, either by supporting do-it-yourself repair through extensive walk-you-through manuals or by other TRS-80 users offering commercial repairs. Here we can clearly see a community's agency taking over maintenance and support roles traditionally provided by commercial services or the original manufacturers.

From 'simple customer' to 'active user'

Let us focus even more on the relation between commercial commodities and the role of the end-user with regard to maintenance and support. A 'classic' work addressing the emergence of creative novelties, although with a focus on techno-scientific innovations this time, is 'Science in action' (Latour 1987). Instead of 'social worlds' the main unit of analysis are 'actor worlds' or more precisely 'actor-networks'. For this paper most importantly is the explicit attention given to the symmetry between the agency of humans *and* non-humans. Innovations can only function when they are simultaneously supported by networks that are built of people as well as of technologies. According to Latour, the innovation exists at the point of intersection where the planes of the 'technogram' and the 'sociogram' keep each other balanced. This paper builds its analysis of understanding the emergence of 'community innovations' as meeting the challenge of creating actor-networks that can withstand resistance successfully. In linear models of the innovation process, such as the 'diffusion of innovations' model (Rogers, 1995) located at the beginning of the chain are the 'inventors' and at the end the users whose only role it is to 'consume' the innovation-turned-into-product.

In the case of community innovations in general, and in the Wireless Leiden case in specific, there is no such entity as an ideal typical 'User' involved. What is distinctive for innovation communities is the diversity of the people involved. In a previous paper on Wireless Leiden the focus was on the user-innovators, who can be best described as hobbyists, tinkers or hackers. In this paper the focus is on the 'end-user' of community innovations, or in terms of diffusion theory the 'simple customer' (Latour 1987, 137). In short: people without technical expertise, hobbyist or volunteer motives, or economic interests in relation to a novel artefact. However, we can ask the same question Latour raises: "how simple is a simple customer?"

According to Latour, the 'customer is "simple' because he or she does not have to redesign" the technological artefact (ibid 137). However the fact that the user has had no role in the original design of an artifact does not mean that there is no active involvement:

“[E]ven when the phases of development and innovation have ended, the darkest black box still has to be maintained in existence by not so simple customers. [...] The more automatic and the blacker the black box is, the more it has to be accompanied by people. In many situations, as we all know all too well, the back box stops pitifully because there is no salesperson, no repairer, no spare part. Every reader who has lived in an underdeveloped country or used a newly developed machine will know how to evaluate the hitherto unknown number of people necessary to make the simplest device work! So in the most favourable cases, even when it is a routine piece of

equipment, the black box requires an **active customer** and needs to be accompanied by other people if it is to be maintained in existence.”

It is exactly this active customer or active user that we follow in the case of Wireless Leiden. What makes community innovations so interesting is the way in which they differ from ‘commercial’ innovations that are distributed via the free market to simple customers. The innovation chain is usually depicted as a linear line with at the left side the inventor/innovator who generates the idea, in the middle the producer/manufacturee who transforms the idea into physical mass-produced artifact and at the user/consumer who buys the product. What is important here is that the end-user is a simple customer whose is simple as Latour (1987, 137) states “because he or she does not have to redesign” it.

When a device stops working, it needs someone else to solve the problem. This is what we call ‘maintenance’. When a user stops working, he or she needs someone else to solve the problem. This is what we usually call ‘support’.

When we are dealing with community innovations (networks in which the community and innovation are intertwined as heterogeneous assemblage) this become more complex. What happens when a community innovations stops working? Who is going to solve the problem? How are both maintenance and support organized? How can a community innovation be ‘fixed’ to get iworking again? How is the ‘infrastructure of support’ for both the WL community as well as the WL Wi-Fi infrastructure organized? The specific focus for this paper is how maintenance of a community innovation is organized when the resources of traditional corporate organizations are lacking such as call centers, service and repair personnel and even budgets are lacking. One of the perceived problems of community innovations is that guaranteed service and support are lacking, making the service or technology in the eyes of the users inherently unreliable. Let us have a look at how WL deals with this issue.

§3 Supporting residential end-users

The history of the innovative Wi-Fi use started in 2001 when one person got the idea of changing ‘indoor, short-range, cable-replacement’ Wi-Fi consumer devices into ‘outdoor, long-range, infrastructure’. Instead of trying to accomplish all the work alone, this user-innovator started to actively recruit people from the local Linux open source software community to help accomplish the goal of building a local free wireless communication infrastructure. In 2002 the initiators came up with a name, goals and an official organization structure for what had by now become a ‘project’. In the summer of 2002 both a website and an official foundation were registered under the name ‘Wireless Leiden’. From that moment on, an active public relations strategy was pursued trying to get ‘in the news’ as often as possible. To make the local networking attractive for residential end-users, through the partnership with the Internet Service Provider Demon free access to World Wide Web was offered through the donation of three 8Mbit ADSL connections. What had started as a technical hobby club for Wi-Fi hacking had set its goals to the building of a local wireless infrastructure.

The Wireless Leiden organization consists of an ‘esoteric’ technical Wi-Fi hobby community that takes care of designing, prototyping, testing, building, and maintaining the local Wi-Fi nodes, an exoteric circle of non-experts who connect to the wireless network for (free) internet connectivity or local file sharing. As an ‘interface’ between the esoteric and exoteric

WL circles and the outside world a non-profit foundation was created in 2002. The WL foundation acts both as a 'front-office' for public relations activities as well as a legal person for creating legally valid agreements with other organizations and companies. Since 2005, the local municipality offered housing for free where volunteers can meet, where 'helpdesk' office hours are held, and where the board can meet. What makes the network special is the fact that many of the Wi-Fi nodes that make up the network are privately owned by individual volunteers, so property of the infrastructure is distributed over the WL members.

Although in consumption studies, the act of consuming in itself is seen as 'active', this is certainly true in the case of the use of a community innovation of which WL in this paper serves as an example. In the case of subscribing to a commercial Internet service the path to be taken is clear. For ordering the 'installation package' as a consumer you can choose between different service channels: filling out a website form, talking with a company representative on the phone number or visit a local shop. In the case of community innovations things get complicated: how to 'buy' or 'subscribe' to Wireless Leiden? What are the 'service channels' when there is neither 'store' nor 'web shop' to order your 'installation package'?

Following a WL end-user

To give a better insight in the users' perspective of Wireless Leiden, we will follow a typical WL end-user, called Linda to see how she managed getting herself and her family connected to the Internet via the Wireless Leiden infrastructure. Linda lives in a small town of approximately 22.000 inhabitants near the city of Leiden. She works at a small law firm as a lawyer, is married and mother of two children of primary school age. How did Linda make the active decision to start using 'Wireless Leiden' and managed to create a working connection?

For Linda the Internet entered her house in the form of a phone line connector at the backside of her computer. Every time she clicked on the Internet Explorer icon on her Windows 98 desktop, the computer automatically connected to the Internet. Because the phone connection in her house was of the 'ISDN' type, her family could surf the web and have phone conversations simultaneously. When in the summer of 2004 she bought a new computer (a special discount offer at the local supermarket) she discovered it was lacking a built-in ISDN connection. In order to restore access to the Internet again she now had several options. Or to frame it differently, Linda was standing at a 'consumption junction' (Cowan 1987): continue with ISDN, or alternatively organize a subscription to cable or ADSL Internet. In the case of ISDN she would have to buy a new ISDN modem. What bothered her however, was the 'pay per minute' subscription model. Especially now her two children were increasingly using websites such as Wikipedia to complete school assignments, she disliked this idea, because this could turn out to be an expensive affair when considering her children's increasing Internet use. The second option then would be a subscription to cable or ADSL Internet, both available in her town. Then the connection fee would consist of a fixed monthly amount.

But then, serendipitously, a local third alternative offered itself when her father during a weekend visited opened his Wi-Fi enabled notebook computer, and noticed a Windows message that told him he was connected to something called 'ap-omni-hofwijck'. This appeared to be part of the Wireless Leiden infrastructure. After some fiddling with the proper configuration of something called a 'proxy' (for some browsing on the web her father temporarily used his commercial GPRS subscription), the notebook computer was able to surf

the web. And the best thing: it all worked for free. A few days later, when browsing the web at work, Linda finds that a local Leiden hardware store sells all the necessary equipment to connect to WL. In the weekend Linda and her husband visited the electronic shop and for about 150 euros they had a complete ‘package’ with outdoor Wi-Fi antenna, ‘bridge’, indoor Wi-Fi access point. In this way, they did not need to install any additional cabling between the rooftop antenna and their PC located in the living room on the ground floor.

From Linda’s perspective WL offered a ‘free Internet’ without time restrictions. Additionally she sympathized with the fact that the local Leiden initiative was based on the idea of ‘free access for all’.

“Of course I knew it was going to be different, because when you subscribe to an ADSL connection, an installer comes to do all the work for you and then everything works. And Wireless Leiden requires a lot more self-activation. You need to install an antenna on the roof of your house, and then you need to install all the indoor cabling or buy an indoor Wi-Fi router. Actually, it was quite a hassle to get everything working. [...] Luckily, when we made a phone call to the shop, the owner was prepared to drop by and fix the whole thing and make it work. He did this for free; I believe it was a kind of goodwill service.”

What had assured Linda to try out the ‘free Internet’ was that when she bought the Wi-Fi set, the shop owner assured her that when the Wi-Fi solution did not work out, she could return the package and receive her money back.

However when some time later new problems arise with the WL connection, Linda could not fall back on the shop owner anymore for support. After some browsing of the WL website she decided to send an e-mail to the WL user mailing list. In the subject heading she framed her problem as “Nitwits want Wi-Fi in the vicinity of Leiden”. The first thing that happened was that other people send her a ‘debugging checklist’. This is a specially crafted document to guide novice WL users in concrete steps to the procedure of establishing a working connection or otherwise pinpoint the exact problem in case of failure. In Linda’s case this strategy failed, and as a final resort one of the volunteers had to come to visit Linda’s house to help her solve her connection problem. Although WL is a volunteer organization, there is no such thing as a free lunch. As a favor in return Linda was asked to give a presentation during a general introduction meeting about WL specially targeted to potentially interested users, which she also did. So here we see a pattern of new end-users who are actively helped to get connected by neighboring WL volunteers. In return for this support active participation in the form of helping others is expected.

§4 Maintaining physical Wi-Fi nodes

The preparedness of end-users to actively engage with the technology is of crucial importance for the functioning of the WL community technology. Without maintenance eventually every technology breaks down, however community technologies such as WL depend even more on active maintenance work. The specific problem with community technologies is that the initiating designers of the system often are not interested in the maintenance. This is also true for WL. Most of the technical experts are more interested in experimentation with new technologies than in fixing a wireless node for the hundredth time. When the technical enthusiasts speak about their motivation for participating in WL they often use a ‘frontier’

metaphor of ‘pioneering’ or ‘cowboying’, however ‘caring’ for the both end-users or technology is missing from this vocabulary.

This lack of motivation for maintenance and support tasks is something many WL participants have observed themselves as a potential problem for the further growth and development of WL. As a solution for the lack of resources for maintenance work a strategy for delegating tasks to end-users emerged. In order to systematically bring end-users into action to the greater good of the WL network, a specific new ‘role’ within the community was invented: the so-called ‘node-adoption-volunteer’. Interestingly enough in this case the term ‘adoption’ was introduced to describe the relation between the active end-users and ‘their’ Wi-Fi nodes. Adoption implies a warm implicit undertone of respectfully taking care of a ‘child’ who from now on will be a member of the family. The adoption metaphor fits in with the locus of the community. The ‘adoptee’ that needs help in this case is a geographically close-by located Wi-Fi node. The ‘parent’ is the end-user who relies on the node for its Internet access. The family is not the household, by the wider WL community.

In this section I trace back the emergence of the so-called ‘node-adoption-volunteer’ in February 2004. At that time one of the residential end-users of the WL infrastructure decided to add a more positive note to his e-mail complaint about the breakdown of the WL Internet gateway:

“I feel like the aggrieved consumer who can only complain ... that is not the position I want to take up. I would like to contribute too, but when I look at the list of vacancies I become disheartened by the level of expertise that is required: project leaders, people who know the ins and outs of TCP/IP.”

What this user implicitly asks is: I would like to contribute something back to WL, but I do not know what or how; can somebody help me to contribute back to WL? With this post he starts an e-mail discussion in which the ‘usefulness’ of user-contributions is discussed. After several invitations to join one of the “technical meetings” or the “systems administration mailing list” one of the ‘technical experts’ ironically further sparks the discussion when he states that “unfortunately it is not attainable that every user can contribute something to the network, except for additional data traffic ;-)”. One of the initiators responds:

“I do not agree with you on this, because I do think anybody can contribute something. You do not any understanding of computers. For example helping organizing meetings or with the maintenance of the website are important activities. One of the most time consuming jobs is powering nodes on/off. Something not to be done very often (sometimes such a machine happily runs for half a year or even longer), however sometimes it is the only solution to bring it back to life. Perhaps it is an idea to let users adopt the specific node they are connected to, in order to monitor its performance, report problems or if necessary reboot the machine on location. Additionally, a yearly inspection if everything is still well connected. The advantage is that they live close-by and immediately notice problems in case of a malfunctioning. Not difficult to do, no special expertise required and it would save the volunteers a considerable amount of time. And above all, this way even more people are actively engaged with the network.”

In the following days several users ‘volunteer’ to adopt a node, the official term ‘Node Adoption Volunteer’ is invented, and in April 2004 the first ‘node-adoption group’ meeting

takes place. One person summarizes the ‘gift economy’ from the end-user’s perspective: “I would like to invest some time into this so I can do something in return for the Wireless Leiden network I am using.” This then triggers one ‘official volunteer’ to react agitated: “Then put some of your time in other WL projects. That way you show that it is not directly self-interest!” Another official WL volunteer relativizes this remark by noting that “we should also realize that self-interest is not too bad, because in the end the network is served by it as well: or in modern management-lingo a win-win situation”. Another poster agrees as well: “Of course there is self-interest: learning new things and spending your free time useful, but that is true for all WL volunteers”.

In November 2004 and January 2005 the WL end-user who signaled he would like to contribute but did not know how, gave a presentation during official meetings about ‘the user annex node-adoption-volunteer: his presentation is announced as “a WL user talks about his experiences as user and node adoption volunteer of one the most important nodes of the network”’.

§5 Informal support infrastructures of warm helpers

Informal support is not something that is confined to community innovations. In her research on the domestication of the Internet, Bakardjieva (2005) noticed a similar phenomenon. The fact that Bakardjieva explicitly focused on domestication of Internet access allows for a comparison of her empirical material with the WL study.

Bakardjieva (2005, 98) noticed that the ‘domestication’ of the Internet “had been intensively assisted by a close friend”. She called this person the ‘warm expert’ and which she defined as:

“The warm expert is an Internet/computer technology expert in the professional sense or simply in a relative sense compared with the less knowledgeable other. The two characteristic features of the warm expert are that he or she possesses knowledge and skills gained in the system world of technology and can operate in this world but, at the same, is immediately accessible in the user’s lifeworld as a fellow-man/woman. The warm expert mediates between the technological universal and the concrete situation, needs and background of the novice user with whom he is in a close personal relationship.” (Bakardjieva 2005, 99).

The ‘economy’ of the warm expert helping out a close-by person is not a financial one such as the relation between repairmen and customer, but gift-based. In return for helping out, the warm expert is offered for instance “lunch and, as one can imagine, the enjoyment of spending time with a friend.” (ibid., 101). In WL we see the same mechanism at work, although the dimension of proximity is organized within the WL community. In WL we see a ‘gift economy’ in action in the empirical data, and ‘reciprocity’ towards community members (‘tit-for-tat’) is how the keeping-it-all-working is organized. When an expert helps a user to get connected, the user then is asked to help other users (by rewriting ‘debugging check lists’, by giving a presentation in for end-users comprehensible language or by taking over relatively easy ‘maintenance’ tasks. In this way the end-user also helps the expert with maintenance of the technology and support to the (end-user) community.

A difference emerges between getting connected to the Internet via a commercial ISP or via a community innovation such as WL. In her introduction Bakardjieva writes that:

“Users are hard to perceive as a social group that shares a common technological frame because of their dispersed state of existence, as well as their diverse cognitive and material resources, interests and ideologies. Users inhabit numerous invisible everyday settings. They have no established forums or channels for interaction either with each other or with the designers of the technologies they employ. In contrast, researchers, engineers, managers and government representatives form distinct professional networks. They share cognitive frames of reference acquired in the course of their training and subsequent participation in a community of practice.” (ibid., 13)

In the case of community innovation the relevant difference is the availability of ‘forums’ and ‘channels’ in the form of local meetings, mailing lists and interactive wiki’s. It is actually through these channels that interaction with the designers of the system is possible, through the aforementioned ‘channels’ or ‘nexus’. This then results in the formation of a ‘community of practice’ organized around the shared participation of in this case WL. For ‘warm experts’ to be able to function in the case of community innovation in which people are often no friends or relatives (yet), there is an infrastructure needed through which people can ask for ‘help’. This infrastructure then is an ‘infrastructure of support’ that enables the correct functioning of the users and the devices interacting with each other.

Within a community innovation the gift economy is one of the principles on which maintenance and support work is organized. Examples of reciprocal gifting by end-users in return for help are writing documentation, answering e-mails of other novice users, giving presentations. Warmth then also refers to the gift economy instead of a financial economy. Where in the traditional situation you would pay money to the company that pays the salary of the repairmen, in the case of community innovation, you ‘pay’ the community of which the warm expert is a member, by donating resources back to it in the form of time, energy or concrete products such as manuals, documents, bug reports, or answers to questions.

In this sense not only the warm expert who with his intimate knowledge of the inner workings of the technology can help the user, but also the warm end-user with his intimate knowledge of how he or she thinks new technologies work can help the experts with supporting the community, but also with literally and figuratively holding the technological devices in order to get connected again to the network in case of a problem. The unit of analysis then is not the individual user, but the community innovation as a whole, consisting of both humans as well as non-humans. If elements of the network for what kind of reason get disconnected they can then be helped by warm end-users to get connected again. In the situation of a commercial Internet access subscription unstable technologies are not forgiven, and the company is expected to fix problems as soon as possible. However, in the case of community innovations, end-users are more forgiving and prepared to ‘help’ the technology in case of a failure.

Where Bakardjieva (2005, 102) writes that “[t]he learning experiences of new domestic users of the Internet recounted here thus exhibit a profoundly social character” I argue that in the case of WL this social learning is technically organized through wiki’s, mailing lists, homebrew ‘debugging lists’ as well as socially through local meetings and personal visits. In addition when Bakardjieva (ibid) writes:

“Friends and relatives, and to some degree online helpers, had taught my respondents not only how to navigate the interface but also what they themselves had discovered the Internet could do for them as a communication medium”.

In the WL comparison however end-users have learned not only what WL can do for them, but additionally what they can do for WL. Vis-a-vis a model of 'warm expertise' there has emerged a model of 'warm maintenance'. Where support of end-users is organized by warm experts helping people to get connected, the equivalent is maintenance of the technology organized by warm end-users helping devices to get connected again if needed. The underlying goal in both situations is to reconnect elements that got disconnected to the network. The warmth based on proximity and personal physical contact not only applies to humans but also to non-humans in the case of community innovation.

Conclusion: The role of the 'warm end-user' for community innovation

Earlier students of science and technology have pointed us to the importance of 'invisible' actors in the practice of 'doing science'. Shapin (1989) for instance pointed to the importance of the generally overlooked 'invisible technician' in the history of science without whom we cannot understand science as a process. Following this line of thought in the field of innovation studies, I argue that we cannot understand community innovation as a process without explicit attention to the diversity of roles actors such as end-users without explicit technical expertise play within community innovations.

With this paper I hope to have sensitized the reader to the importance of the 'warm end-user' in the practice of maintaining community innovations. By doing so, I hope to have changed the image of a consumer of new technologies as a 'simple customer' into an 'active user'. The difference between a user-innovator and a warm user then is that the user-innovator actually works 'under the hood' of the technological black box, while the work of warm end-users can better be understood as articulation work that remains invisible to outsiders of the community.

The phenomenon of active end-users as an essential part of the 'infrastructure of support' of a distributed innovation are not only limited to grassroots/bottom-up/non-profit/non-commercial ICT network innovations. In the case of Wi-Fi networking interesting models are emerging in many different shapes and sizes on various locations. A very interesting example is the FON initiative (www.fon.com), in which a company tries to mobilize residential Wi-Fi users to share their commercial ADSL or Cable internet access with a global 'community' of 'Foneros'. Users themselves pay for the local Internet connectivity, for the Wi-Fi hardware, the electricity bill and the maintenance of this configuration. Motivation of participation is organized along the line of becoming a 'Fonero', a member of the 'FON community'. Eventually the company hopes to introduce a financial compensation model for the 'Foneros' as well; at this moment it is not yet realized however.

An interesting question is in how far users will be motivated by and are able to identify with commercially organized distributed network innovations in which they are supposed to play an active role. This will depend on finding strategies to mobilize users' sympathy in order to access their resources. In this respect further research is needed to develop a better insight in the enabling and constraining elements that configure the appropriation and domestication dynamics of distributed ICT innovations in which users play a crucial role.

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Cluster Analysis Of Internet Users: A Longitudinal Examination

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Abstract

Different groups of people may use different types of internet connections for different goals. The first objective of this exploratory study is to identify a small number of relatively homogeneous groups of Internet users, based on their usage patterns (for example typical 'gamers' or 'serious information seekers'). Secondly, we aim to identify the characteristics of the internet users that are in the different clusters. We focus on demographics, experience and the connection used (broadband vs. narrowband). Thirdly, we aim to identify changes of clusters over the years (2001, 2003 and 2005). The data were collected by an online questionnaire in the Netherlands, where the first wave of data gathering was in 2001 (N=1072). The second took place in 2003 (N=2325) and the last measurement was in 2005 (N=1102). Questions regard type of internet access, activities on the internet, skills and experiences, wishes and expectations and the reasons for and impediments to switching to a broadband connection.

To identify the groups of internet users cluster analysis was performed. For each of the three years we have identified five clusters of internet users. Based on our analysis from the clusters and developments over the years, we conclude that there are two dimensions in the diffusion process: intensity of use and spreading over (internet) society. This results in different activities that go through different diffusion processes.

Introduction

Someone might use the Internet to look up information like train departure times, telephone numbers etc. Someone else may not see that as the main function of the Internet at all. He might like to listen to online music and rather look at pictures of his grand children. Yet another person may go online to send e-mails and find information, others use the Internet more professionally.

Many different kinds of people use the Internet, for a variety of things. The question however is which kinds of people use which kinds of Internet applications? Can groups of Internet

users be recognized that are for example typical 'gamers' or 'serious information seekers'? And what kind of people are they?

The objective of this study is to identify a small number of relatively homogeneous groups of Internet users, based on their usage patterns and secondly, to observe whether these clusters are stable over the course of time. Adding demographics to the patterns make this information even more valuable. Insights in these patterns make it possible to better understand and predict Internet usage. With this information Internet service and content providers can offer their target groups applications that better fit the needs of each of those groups. More specifically with regard to broadband service development.

The Netherlands has the second-highest penetration of broadband at 22.5 subscribers per 100 inhabitants (OECD, 2005). This rapid adoption process makes the Netherlands an interesting case for other countries. Here, we can look at what people actually do online and the changes these usage patterns go through/

Theoretical background and research questions

Although we consider this research an explorative research, there clearly is a theoretical background for this research. The main assumption is that the use of an innovation is not static, but rather evolves over time. According to Rogers' Diffusion of innovations (1995) it takes time before new technologies spread through society. Innovation does not stop when an innovation is adopted, but continues throughout its use (Johnson & Rice, 1987; Kline & Pinch, 1996; Leonard-Barton, 1988; Rosenberg, 1982). People with different lifestyles are likely to show different internet usage patterns. But also per individual the usage patterns can change over time. Constantly people evaluate how an innovation or technology fits within their daily routines. The usage of a technology can change because of changes in daily routines and activities, but also the usage of the technology can cause changes in daily routines (mutual shaping).

During the implementation phase functions of a technology can change by usage patterns and experiences. This process can be divided into several phases (Rogers, 1995, Silverstone & Haddon, 1996, Agarwal & Prasad, 1997). Silverstone and Haddon (1996) describe how new technologies are incorporated within the daily life of users by means of a process of domestication. The central issue is the interaction between technology and the user. This process of mutual adaptation is called domestication of technology. Other researchers (Johnson & Rice, 1987; Rice & Rogers, 1980) speak of *reinvention* of the technology when the adopted technology is used for functions that it wasn't intended to. For broadband this is very well imaginable, maybe even more so than for other technologies, because there are so many different application and services that are and will be offered through broadband. Every service or application offered via broadband is a change in software, hardware or devices, and therefore an innovation in itself, with its own adoption process. In order to understand the meaning of technology for an individual or household is not sufficient to look at characteristics like income, educations and age. More important is to obtain insight into how people use technologies and how the usage patterns change. In 2001 broadband was quite new and it probably was not incorporated in the daily lives of people as it is now. Therefore, it is interesting to see whether clusters of internet users can be recognized, based on usage patterns, and whether the clusters have changed from the introduction of broadband to the point that broadband became a fully fledged technology with many users. Can we recognize the same clusters over the years or do we see new kinds of clusters emerge and others disappear?

The research questions for this exploratory study are:

1. To what extent can individuals be clustered based on their Internet usage patterns?
2. How can the clusters be characterized (demographics and internet experience)?
3. To what extent can these clusters be recognized over the course of time?

ICET-model

For this research we have identified four needs that can be gratified by the internet. These needs are mainly deduced from Uses and Gratifications research (Katz, Blumler and Gurevitch, 1974, Katz, Gurevitch and Haas, 1973). These needs are translated to activities that can be carried out online. Our ICET-model takes into account Information (gathering), Communication, Entertainment and Transactions. This model is used as an apprehensive way to group 4 distinct, but not mutually exclusive activities.

** The need for information*

In research into the needs and uses of internet researchers have mentioned in one way or the other the need for Information. In terms of Katz et al. (1974) this need is a cognitive need. But also McQuail (1987), Rubin (1994) and Papacharissi & Rubin (2000) mention this need. It is often proved that information gathering is an important reason to go online (Maltha, Schuurman, Vermaas, Vandeberg, Bongers, Bekkers & V/d Wijngaert, 2002; Maltha, Bongers, Schuurman, Vandeberg, Vermaas & V/d Wijngaert, 2003). Information is made more accessible by the internet and an abundant amount of information can be found online.

** The need for communication*

Social interactive needs (Katz, 1974), social Interaction (McQuail, 1987), social Companionship (Rubin, 1994), Interpersonal utility (Papacharissi & Rubin 2000), it all comes down to the need people feel to be in contact with other people. Also for this need, the internet has brought tremendous changes. It is now possible to be in contact with almost everybody, independent of time and place.

** The need for entertainment*

Besides the need for information and communication also the need for entertainment is an important need for many people to be gratified. Other U&G researchers also pay attention to this need: entertainment (McQuail, 1987), escape (Rubin, 1994), affective and tension release needs (Katz, 1974) and pass time and entertainment (Papacharissi & Rubin, 2000).

** The need for transactions*

Completing online transactions is an increasing important driver to go online, because of the decrease of economic transaction costs (e.g. finding a physical seller, transportation costs and duration). However no specific attention is given to the need people have to complete transactions. This need might be more like an obligation, but apparently people feel the need to complete transactions online (and not through traditional media). The need to complete transactions is not easily comparable with needs stated by U&G research, but it is an activity that can very well be carried out online.

As stated before, all these needs can be gratified through the internet and can be translated into internet activities. For each of these services (table 1) respondents were asked whether or not they have used it.

Table 1. The functions of the internet

Information	Communication	Entertainment	Transactions
Information via search engines	Communication via messenger	Entertainment via gaming	Transaction via buying service or product from provider
Information via portals	Communication via chat website	Entertainment via watching films	Transaction via online marketplaces for individuals
Information via websites (url or favorites)	Communication via IP-telephony	Entertainment via downloading films	Transaction via auction website
Information via reference works	Communication via Webcams	Entertainment via uploading films	Transaction via tele banking
Information via streaming audio/video	Communication via Reading of a weblog	Entertainment via owning/maintaining a community	Transaction via making reservations
Information via newsletter	Communication via Writing/publishing a weblog	Entertainment via participating in communities	
Information via newsgroup	Communication via e-mail	Entertainment via downloading/watching tv	
Information sharing via discussion groups	Communication via SMS (from computer to mobile)	Entertainment via downloading/watching videoclips	
Information sharing via own website	Communication via newsgroup	Entertainment via sharing videoclips	
Information via information forms		Entertainment via listening to music	
		Entertainment via downloading music	
		Entertainment via sharing music	
		Entertainment via downloading photos	
		Entertainment via sharing photos	
		Entertainment via e-mail	
		Entertainment via surfing (fun surfing)	

Research method and data collection

Longitudinal data

The data for this paper is collected in a longitudinal study that allows us to see how technology use is developing over time. The first data collection was in 2001 (September - November). This resulted in 1072 respondents. The second wave of data gathering took place from January to March 2003. The response consisted of 2325 completed and usable questionnaires. The last measurement was from October 2004 to February 2005 and resulted in 1102 completed questionnaires. The method used is an online questionnaire. The objective of this survey is to obtain insight into current internet behavior. Questions regard type of internet access, activities on the internet, skills and experiences, wishes and: expectations and the reasons for and impediments to switching to a broadband connection.

Cluster analysis

We used cluster analysis to organize the data into meaningful structures. Cluster analysis suggests a classification scheme of grouping cases into a certain amount of classes (Everitt, 1977). Here cluster analysis is used as a pattern recognition technique to summarize relatively homogeneous Internet usage patterns. The collected data from 2001 is slightly different from the data collected in 2003 and 2005. In 2001 respondents were asked to state for every online activity how often they carried it out (5 point Likert scale ranging from “never” to “more than once a day”). Whereas in 2003 and 2005 respondents were asked which three activities they used most. These data are binary: the three activities most carried out, were given the value 1 and those not (regularly) carried out the value 0. Specific items in each scale (ICET) are more or less similar over the years. Therefore, we had to recode the data collected in 2001 to the same detail level of 2003 and 2005. In order to do so, we constructed a top 3 activities from the 5 point scale by taking the highest scores per respondent per ICET element. As a similarity measure Dice was chosen (also known as the Czekanowski or Sorensen measure).

With this index joint absences (0-0 matches) are excluded from consideration. This is important, because only top 3 activities were given and the rest of the activities had the value 0 and so there are a lot of 0-0 matches. Considering 0-0 matches would give a wrong image. The cluster method used is average linkage. Average linkage within groups is the mean distance between all possible inter- or intra-cluster pairs. The average distance between all pairs in the resulting cluster is made to be as small as possible. This method is therefore appropriate when the research purpose is homogeneity within clusters. After examination we concluded that for the data of 2003 the data could be best divided into five clusters. The procedure followed is an examination of incremental changes in the agglomeration coefficient. Fewer clusters would leave out information, while more clusters did not add more information. For the sake of comparison and readability we decided to aim at five clusters for each measurement.

Results

Although in each year five clusters were found, there are some differences in size (table 2, 4 and 6). None of the clusters however, is so small that we considered one of them not to be taken into account for further analysis.

In this section we will first per year describe what the main differences are in usage patterns and characteristics of the internet users in the clusters. In table 2, 4 and 6 the internet usage patterns are shown and in tables 3, 5 and 7 the characteristics of the internet users in the clusters. After that we will discuss a broader view of the developments of different internet functions over the years.

While interpreting the clusters and the developments in usage patterns over the years, it is important to bear in mind that in the different datasets different respondents are reached. No conclusions can be made about the development of one particular cluster over the years. Due to the large quantity of data we focus on the main differences and peculiarities.

2001

Table 2 shows the internet functions the people in the different clusters of 2001 use. The largest cluster in 2001 is cluster 3 (N=342). Like in (most) other clusters in 2001 the people in this cluster use search engines for information, communicate via email and messenger, like surfing the web for fun, download photos and they do telebanking. More than others they enjoy email as a way of entertainment. Also different from other clusters is that this cluster frequently uses portals in order to get the needed information. Furthermore, they use audio and video to get information. Summizing, we can say that these people show *moderate, functional usage patterns*. This cluster predominantly consists of men (91%) (table XX). 51% Of the people in this cluster are under 40 years old, 6% older than 60. Half of the respondents have children. Furthermore, they have a middle to high education (respectively 41% and 36%), but this is lower than the other clusters, except cluster 5. Also, there are relatively many broadband users (90%), who go online frequently (92% once a day or more) for up to two hours (57%). With a mean of 7.4 they rate themselves as experienced internet users, but this mean is lower than in other clusters.

Table 2. Summarizing table 2001: activities and characteristics

	I	C	E	T
Cluster 1 (N=261)	★ Search engines ▲ Reference works ▲ Audio & video	★ E-mail ▲ Messenger	★ Downloading photos ✦ Fun surfing	★ Telebanking
Cluster 2 (N=89)	★ Search engines ▲ Portals	★ E-mail ▲ Messenger	★ Downloading photos ✦ Fun surfing	★ Buying from official supplier ▲ Online marketplaces ▲ Auction websites ▲ Online reservations
Cluster 3 (N=342)	★ Portals ✦ Search engines ▲ Audio & video	★ E-mail ▲ Messenger	✦ Downloading photos ✦ Fun surfing ▲ Email	★ Telebanking
Cluster 4 (N=92)	★ Newsgroups ★ Newsletter ✦ Search engines	★ E-mail ✦ Newsgroups	★ Downloading photos ▲ Fun surfing	★ Telebanking
Cluster 5 (N=288)	✦ Search engines ✦ Audio & video ▲ Portals	★ E-mail ★ Messenger ✦ chat websites ▲ SMS	★ Funsurfing ★ Downloading music ✦ Listening to music ▲ Gaming ▲ Downloading / watching films ▲ Sharing photos ▲ E-mail	★ Telebanking

- ▲ 20-40%
- ✦ 40-60%
- ★ 60-80%
- ★ 80-100%

The second largest cluster in that year is cluster 5 (N=288). The use of audio and video for information is highest in this cluster, as is communication via messenger, chat websites and SMS (from PC to mobile). With regard to entertainment they show the highest scores of all clusters: gaming, watching and downloading films, listening to and downloading music, sharing photos and fun surfing. This cluster is made up of young, lower educated (probably because they have not finished their education), broadband users, that go online more frequently and stay online longer than those in the other clusters. Maybe these internet users are best classified as *young fun users*.

Cluster 2 is the smallest cluster (N=89) and the internet users in this cluster show differences in the way they use complete *transactions*. They have highest scores on: buying products or services from official providers, transaction via online marketplaces for individuals and auction websites and they also make online reservations more than all of the other clusters, but they are not used to telebanking. The people in this cluster are relatively young (64% is under 40 years old), are high educated and are mostly men (90%). In this cluster there are relatively many narrowband users (25%) and they go online less frequently than people in the other clusters and for a relatively short amount of time.

Cluster 4 (N=92) is different from the other because of the use of newsletters and newsgroups for information as well as for communication. These internet users can be characterized as *serious debaters*. The people in this cluster are higher educated than others and this cluster contains the largest proportion of male internet users, who rate their own internet experience slightly higher than people in the other clusters. 60% has no children.

Cluster 1 (N=261) is quite similar to cluster 3, again using their internet connection for *moderate, functional uses*. Although this cluster does not use portals (most other clusters do), but does use reference works (online telephone guides etc.) to get information. Like cluster 3 and 5 they use audio and video for information. People in the cluster are mainly aged between 20 and 40 (55%), have mid to high education (41%). This cluster contains more women than the other clusters (12%) and there are relatively many narrowband users (21%).

Table 3 characteristics of internet users in clusters in 2001

		2001				
		1	2	3	4	5
		(N=261)	(N=89)	(N=342)	(N=92)	(N=288)
Characteristics	Cluster					
age	-20	8%	9%	6%	6%	21%
	-40	51%	55%	45%	44%	53%
	-60	36%	33%	43%	43%	25%
	60+	5%	3%	6%	7%	1%
education	high	41%	43%	36%	54%	28%
	mid	41%	38%	41%	32%	47%
	low	18%	19%	24%	14%	28%
gender	male	88%	90%	91%	95%	89%
	female	12%	10%	9%	5%	11%
household	children	44%	44%	50%	40%	48%
	no children	56%	56%	50%	60%	52%
connection	broadband	79%	75%	90%	85%	93%
	narrowband	21%	25%	10%	15%	7%
experience	Mean score (1-10)	7.7	7.6	7.4	8.0	7.9
frequency online	> once a day	75%	57%	76%	82%	91%
	once a day	15%	33%	16%	11%	6%
	> once a week	9%	10%	9%	8%	3%
	once a week	2%	0%	0%	0%	0%
duration online	less	0%	0%	0%	0%	0%
	<2 Hours	62%	61%	57%	56%	33%
	2-4 hours	25%	25%	30%	20%	32%
	4-8 hours	10%	8%	8%	19%	20%
	> 8 hours	3%	6%	5%	5%	15%

2003

In 2003 the largest cluster is cluster 1 (N=744) (table XXX). The rather *moderate usage* pattern is made up of using search engines (as is the case with all the other clusters), portals an more than in other clusters directly accessing a website by typing in the URL or clicking on the website in a list of saved favourites. Communication is done via email, which is used by all of the clusters. Gaming and downloading music are done moderately, whereas fun surfing is done frequently. Online transaction are only telebanking for this cluster.

The second largest cluster is cluster 3 (N=707). They frequently use discussion groups for information, whereas none of the other cluster does that. This is also the case with sharing information via an own website and communicating via newsgroups. They are the only cluster that does not use portals. Rather they go directly to a relevant website by typing in the URL or via saved favourites. For communication they use messenger and, as do all the other clusters, email. Fun surfing, gaming and downloading music is done by almost all clusters in this year, also by cluster 3. Apart from cluster 3 however, none of the other clusters own, maintain or use communities. Transactions for cluster 3 are buying from a website of an official supplier, telebanking and making reservations. People in this cluster seem quite lively, with lots of *entertainment and discussion/newsgroups*.

Cluster 2 (N=562) is different from the other clusters because of the extensive use of audio and video for information. Also messenger is used quite frequently. This cluster is the only one in 2003 that watches films online. Downloading video clips is only shared with cluster 4 and more than in the other clusters music is downloaded. Entertainment is important to the people in this cluster.

The usage pattern of cluster 4 (N=228) is quite similar to that of cluster 2. It involves quite a deal of information via portals and also reference works are used as a source of information. Messenger for communication is used moderately, as are online gaming opportunities. Fun surfing is done a lot and by this cluster the most online reservations are made.

The remaining cluster 5 shows *moderate usage* and uses reference works more than the other clusters and also portals are used more than three other clusters. Downloading photos and fun surfing are done to a certain extent.

Table 4. Summarizing 2003: activities and characteristics

	I	C	E	T
Cluster 1 (N=744)	★ Directly to URL ★ Search engines ▲ Portals	★ E-mail	★ Fun surfing ▲ Gaming ▲ Downloading music	★ Telebanking
Cluster 2 (N= 562)	★ Search engines ★ Audio & video ▲ Directly to URL ▲ Portals	★ E-mail ✦ Messenger	★ Downloading Music ✦ Fun surfing ▲ Gaming ▲ Watching films ▲ Video clips ▲ Downloading photos ▲ E-mail	★ Telebanking ★ Buying from official supplier ▲ Reservations
Cluster 3 (N=707)	★ Search engines ★ Discussion groups ✦ Directly to URL ▲ Own website	★ E-mail ★ Newsgroups ✦ Messenger	★ Fun surfing ▲ Gaming ▲ Owning, maintaining community ▲ Participating in communities ▲ Downloading music ▲ E-mail	★ Telebanking ✦ Buying from official supplier ▲ Reservations
Cluster 4 (N=228)	★ Search engines ✦ Portals ▲ Directly to URL ▲ Reference works	★ E-mail ▲ Messenger	★ Fun surfing ✦ E-mail ▲ Gaming ▲ Video clips ▲ Downloading music ▲ Downloading photos	★ Telebanking ✦ Reservations ✦ Buying from official supplier
Cluster 5 (N=186)	★ Search engines ✦ Portals ✦ Reference works	★ E-mail	✦ Fun surfing ▲ Downloading photos	★ Telebanking

- ▲ 20-40%
- ✦ 40-60%
- ★ 60-80%
- ★ 80-100%

Concerning the age of respondents, cluster 1, 3 and 4 do not differ significant. Furthermore, cluster 2 consists of a lot of young Internet users whereas older people (40-60yrs and 60+) are predominantly clustered in 4 and 5. Difference in education is weak as well as the spread of households (with or without children) and gender; all groups show at least 73% male respondents. Interesting findings are about frequency of being online and duration of Internet use: cluster 1 and 2 are concerned with a high level of frequency (more than once a day) and duration, whereas cluster 4 and 5 show less frequency and duration. Additionally, cluster 4 and 5 are less connected to broadband in contrast to the other groups (table 5).

Table 5. characteristics of internet users in clusters in 2003

<i>Characteristics</i>	<i>Cluster</i>	<i>Cluster</i>				
		1 (N=744)	2 (N=562)	3 (N=707)	4 (N=228)	5 (N=186)
age	-20	9%	27%	5%	3%	3%
	-40	38%	43%	38%	34%	25%
	-60	46%	27%	47%	50%	53%
	60+	7%	3%	10%	13%	19%
education	high	40%	32%	43%	49%	37%
	mid	41%	40%	35%	31%	39%
	low	19%	27%	22%	20%	24%
gender	male	84%	87%	73%	79%	87%
	female	16%	13%	27%	21%	13%
household	children	46%	43%	48%	42%	42%
	no children	54%	57%	52%	58%	58%
connection	broadband	79%	87%	72%	56%	60%
	narrowband	21%	13%	28%	44%	40%
experience (yrs)	Mean score	6.2	5.7	5.6	6.0	6.2
frequency online	> once a day	72%	77%	59%	58%	56%
	once a day	16%	14%	19%	15%	18%
	> once a week	11%	8%	20%	22%	21%
	once a week	1%	1%	2%	3%	4%
duration online	less	0%	0%	0%	2%	1%
	<2 Hours	49%	37%	60%	79%	72%
	2-4 hours	33%	34%	29%	18%	25%
	4-8 hours	13%	18%	10%	6%	5%
	> 8 hours	6%	13%	4%	1%	3%

2005

In 2005 the largest cluster is cluster 3 (N=425). This cluster, like all the other clusters uses search engines, email, telebanking and to a lesser extent fun surfing. The people in this cluster use audio and video for information a lot and they are the only ones to share information via their own websites. Also messenger for communication is used frequently. Watching films online is done by no other cluster than this cluster and also gaming is done to some extent. Downloading music is very popular with this cluster. Furthermore, they use a range of online transaction means: aside from telebanking they buy products and services from official suppliers, use online market places and make reservations.

Cluster 5 is also a big cluster in 2005 (N=276). They are the only ones to use information forms for information. Like the other clusters they also use search engines, portals and reference works for information. For communication they only use e-mail. Watching video clips and downloading photos are means to be entertained for this cluster, although they are not very frequently turned to. Funsurfing is a more important way to get entertained. With regard to transactions, they use telebanking and buy directly from official suppliers of services and products.

Table 6. Summarizing 2005: activities and characteristics

	I	C	E	T
Cluster 1 (N=87)	★ Search engines ✦ Portals ✦ Reference works	★ E-mail	✦ Downloading photos ▲ Gaming ▲ Video clips ▲ Fun surfing	★ Telebanking ▲ Online marketplaces
Cluster 2 (N= 129)	★ Search engines ✦ Portals	★ E-mail ▲ Messenger	★ E-mail ✦ Fun surfing	★ Telebanking ▲ Buying from official supplier
Cluster 3 (N=425)	★ Search engines ★ Audio & video ▲ Portals ▲ Reference works ▲ Own website	★ Messenger * E-mail	★ Downloading music ✦ Fun surfing ▲ Gaming ▲ Watching films ▲ Downloading photos	★ Telebanking ✦ Buying from official supplier ▲ Online marketplaces ▲ Reservations
Cluster 4 (N=185)	★ Search engines ✦ Reference works ▲ Portals ▲ Audio & video ▲ Discussion groups	★ Messenger ★ E-mail ✦ News groups	★ Fun surfing ✦ Downloading music ✦ Gaming ▲ E-mail	★ Buying from official supplier ▲ Online marketplaces ★ Telebanking ▲ Reservations
Cluster 5 (N=276)	★ Search engines ✦ Portals ✦ Reference works ▲ Information forms	★ E-mail	★ Fun surfing ▲ Video clips ▲ Downloading photos	★ Buying from official supplier ★ Telebanking ▲ Reservations

- ▲ 20-40%
- ✦ 40-60%
- ★ 60-80%
- ★ 80-100%

Special in Cluster 4 (N=185) is the use of discussion groups, which no other cluster does. Also newsgroups for communication are popular with this cluster. Furthermore, there is a varied usage pattern with some use of audio and video, which is only also done by one other cluster (3). Messenger is used a lot in cluster 3, as are the possibilities to download music. Telebanking and buying from an official suppliers site are the most used transaction functions, but also marketplaces are visited and reservation are made. In cluster 2 (N=129) e-mail for entertainment is popular. Also, fun surfing is done. For information, communication and transactions the functions used are quite conservative (*moderate, functional usage*): search engines, portals, email, messenger and telebanking. The smallest cluster, Cluster 1 (N=87) downloads more photos than any of the other clusters. Also there is some gaming, watching video clips and fun surfing. Telebanking is done more by this cluster than by the other. Marketplaces are also a way to complete transactions for this cluster. For communication only email is used and search engines, portals and reference works are used for information.

Table 7 shows that in 2005, older respondents are more clustered in 1 and 5 (to a certain extent cluster 2). So, cluster 3 contains more young respondents (< 20 yrs). Concerning education cluster 4 and 5 are highly educated, whereas cluster 2 shows a significant lower level of education, in specific. Cluster 3 and 4 are dominantly connected to broadband: 97 per cent. These respondents (3 and 4) in general started to use the Internet 1 year before other respondents (cluster 1 and 2). The other clusters, certainly the second one (47%), make use of smallband as well. Interestingly, the frequency and duration of Internet use is consistent with that.

Table 7. Characteristics of internet users in clusters in 2005

Characteristics	Cluster	1	2	3	4	5
		(N=87)	(N=129)	(N=425)	(N=185)	(N=276)
age	-20	0%	5%	8%	2%	2%
	-40	30%	34%	41%	53%	27%
	-60	54%	44%	42%	42%	53%
	60+	16%	17%	9%	3%	18%
education	high	32%	27%	39%	43%	46%
	mid	40%	39%	35%	33%	34%
	low	28%	34%	26%	24%	20%
gender	male	75%	66%	85%	69%	77%
	female	25%	34%	15%	31%	23%
household	children	43%	38%	46%	46%	41%
	no children	57%	62%	54%	54%	59%
connection	broadband	78%	53%	97%	97%	75%
	narrowband	22%	47%	3%	3%	25%
experience (yrs)	Mean score	4,6	4,6	5,5	5,8	5,3
frequency online	> once a day	53%	47%	77%	73%	58%
	once a day	23%	36%	14%	16%	25%
	> once a week	17%	14%	7%	10%	14%
	once a week	5%	3%	1%	1%	3%
	less	2%	0%	1%	0%	0%
duration online	<2 Hours	66%	65%	42%	45%	66%
	2-4 hours	25%	29%	34%	37%	30%
	4-8 hours	8%	5%	15%	14%	3%
	> 8 hours	1%	1%	9%	4%	1%

Developments of internet functions

In this section some of the most noticeable developments of the usage of internet functions are described. The first thing that becomes apparent in table 8 is that over all years in all clusters search engines are frequently used for information, email for communication, fun surfing for entertainment and tele banking for transactions. There are however some fluctuations that will be elaborated on underneath.

* *Information*: Search engines are used by each cluster, each year. We do however see that the frequency with which they are used increased. The usage gets more intensified. In contrast, portals do not get used more frequently over the years, but do get used by more clusters; it is spreading over (the internet) society. This is also the case with gathering information via reference works. Information gathering via audio and video downloads shows some ups and downs. In 2001 it is used by three clusters, in 2003 by one and in 2005 by two. The usage has not become more or less frequent over the years. What is eye-catching, is that it only gets used very intensively by one cluster. This is an internet function that is some sort of specialty, very convenient for only a small group of internet users. This is also the case for information via discussion groups, but here, even for the only cluster that uses them, they get less used. Sharing information via an own website is not something for many internet users between 2001 and 2005 and it also does not get used very frequently.

* *Communication*: Messenger has been popular from 2001 through 2005. The main changes we see, is that less clusters use it (in 2001 four clusters and in 2005 three), but the usage is more intense. Special website for chatting (chat rooms) were quite intensively used in 2001 by one cluster, but in 2003 and 2005 it is not in the top three of any of the cluster. Webcams and weblogs are lagging behind and did not get into the top 3 of internet functions of any cluster in any year. Email on the other hand is used frequently by each cluster in each year.

* *Entertainment*: With regard to gaming we see that the number of clusters that practice online gaming first increases and then decreases, but that the intensity, especially in one cluster increases. A similar pattern is observed with downloading music. This seems something many internet users have tried, but will only get a true leisure pursuit for a few internet users. Downloading photos was done by all clusters and quite frequently, but over the

years the usage became less frequent and by less clusters. Funsurfing is constantly used by many internet users and quite frequent.

* *Transactions*: In 2001 transactions are, apart from telebanking, were online completed by one cluster, whereas in later years the usage is much more spread over the (internet) society. Buying products and services from a website of an official supplier has gotten more widely and intensively used.

Table 8 usage of internet functions by clusters in 2001, 2003 and 2005

	2001					2003					2004/5				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Information via search engines	★	★	+	+	+	★	★	★	★	★	★	★	★	★	★
Information via portals		△	★		△	△	△		+	+	+	+	△	△	+
Information via websites (url or favorites)	★	△	+	△	
Information via reference works	△								△	+	+		△	+	+
Information via audio/video	△		△		+		★						★	△	
Information via newsletter				★											
Information via newsgroup				★	
Information sharing via discussion groups			★						△	
Information sharing via own website								△					△		
Information via information forms															△
Communication via messenger	△	△	△		★		+	+	△			△	★	★	
Communication via chat website					+										
Communication via IP-telephony															
Communication via Webcams					
Communication via Reading of a weblog										
Communication via Writing/publishing a weblog										
Communication via e-mail	★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Communication via SMS (from computer to mobile)					△										
Communication via newsgroup				+				★							+
Entertainment via gaming					△	△	△	△	△		△		△	△	+
Entertainment via watching films					△		△						△		
Entertainment via downloading films					△
Entertainment via uploading films															
Entertainment via owning/maintaining a community			△							
Entertainment via participating in communities			△							
Entertainment via downloading/watching tv										
Entertainment via downloading/watching videoclips		△		△		△				△
Entertainment via sharing videoclips
Entertainment via listening to music					+
Entertainment via downloading music					★	△	★	△	△				★	+	
Entertainment via sharing music										
Entertainment via downloading photos	★	★	+	★	△		△		△	△	+		△		△
Entertainment via sharing photos					△					
Entertainment via e-mail			△		△		△	△	+			★		△	
Entertainment via surfing (fun surfing)	+	+	+	△	★	★	+	★	★	+	△	+	+	★	★
Transaction via buying service or product from provider		★					+	+	+			△	+	★	★
Transaction via online marketplaces for individuals		△									△		△	△	
Transaction via auction website		△													

Transaction via tele banking	★		★	★	★	★	★	★	★	★	★	★	★	★	★	★	★
Transaction via making reservations		▲					▲	▲	+					▲	▲	▲	
1																	
▲ 20-40% + 40-60% ★ 60-80% * 80-100% . no measurement for this activity in the relevant year																	

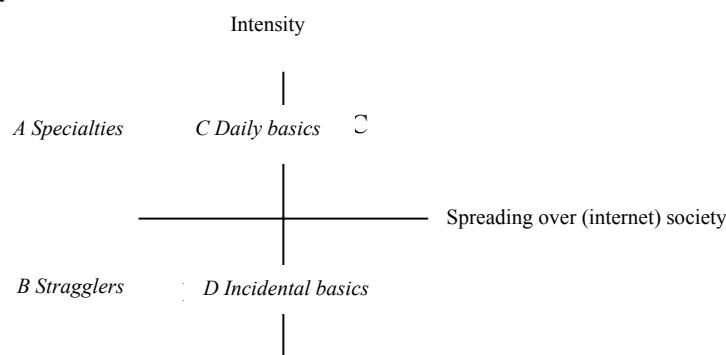
Discussion and conclusion

Different groups of people may use different types of internet connections for different goals. The first objective of this exploratory study was to identify a small number of relatively homogeneous groups of Internet users, based on their usage patterns (for example typical 'gamers' or 'serious information seekers').

It appears difficult to attach such labels on people in different clusters. We do however see cluster characteristics recur over the years, such as internet users with interest in discussion groups and newsgroups (cluster 4 in 2001, 3 in 2003 en 4 in 2005) and people who have a great liking for entertainment. In the first year a group of people distinguishes itself from other groups by performing online transactions more than other. We don't see such a clear difference in later years, as online transactions are more spread over the clusters. Secondly, we aimed to identify the characteristics of the internet users that are in the different clusters. We focus on demographics, experience and the connection used (broadband vs. narrowband). Here we do not see really clear distinctions. Thirdly, we aimed to identify changes of clusters over the years (2001, 2003 and 2005). The rapid adoption process of broadband in the Netherlands (OECD, 2005) makes this country an interesting case for other countries. Results for example show that that over all years in all clusters search engines are frequently used for information, email for communication, fun surfing for entertainment and tele banking for transactions.

Based on our analysis from the clusters and developments over the years, we conclude that there are two dimensions in the diffusion process: intensity and spreading over (internet) society (Figure 1).

Figure 1. Dimensions of changes of internet functions over time: intensity and spreading over (internet) society



A) *Specialties*: Usage of a function gets more intensive (higher frequency), but this function is only used by one or a few specific clusters (e.g. messenger);

¹ The exact proportions of each ICET function we do not know, because the respondents were asked to give a top 3 for information, one for communication and also a top 3 for entertainment and transactions. Respondents could not for example state eight entertainment functions and one communication activity.

- B) *Stragglers*: Usage is not frequent and also not spread over the different groups of internet users (e.g. communities);
- C) *Daily basics*: Usage is intensive and also spread over different groups of internet users (e.g. search engines);
- D) *Incidental basics*: This function is used by many different internet users but the usage is not intense (e.g. downloading photos).

We can conclude that some functions of the internet become more intensively used whereas others get less frequently used over the years. Also some functions are more and more used by specific groups, whereas other functions become general functions for almost all internet users.

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Humans as eActors

I, Agent

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“How it is that animate beings can come out of inanimate matter. What is a self, and how can a self come out of stuff that is as selfless as a stone or a puddle?”

Douglas Hofstadter

Abstract

The paper aims at illustrating the broad-band technology potential presenting new challenging ways to “*e-act*”, affordable now due to this ICT. The perspective is *anthropocentric* (user-centred, from conception to experimental model) and *transdisciplinary* (involving e-actors from many area of interests). The key feature focused on is *affordability* (the applications should be not just inexpensive, but also convenient as tools for ordinary actors in the broad-band society). The overall undertaking regards self-awareness in agent-based systems, is founded on Hofstadter’s ideas [15] and was presented in [6] from a computer science perspective as well as in [8] in a larger interdisciplinary framework. To increase relevance for e-acting, two more paths have been opened: they concern one of the most worrying dangers (ethical behaviour of ICTs, presented in [7] and in a related paper) and one of the most uncontroversial application domains (e-Learning, presented in [23]). The model is embodied by a human-controlled self-aware interface agent, of reduced cognitive complexity. To bridge the gap between this highly abstract feature and agent-based applications meant for open, heterogeneous, dynamic and uncertain environments, the task keeps a definite engineering perspective. Preliminary estimation: the broad-band technology potential seems to allow full scale user-centred development of cognitively *complex*, conceptually *innovative* and practically *affordable* application domains.

1. Introduction. Should Agents Be Self-Aware?

Any contact with GEB [15] is as fascinating now as it was in the eighties and employing Hofstadter’s ideas as backbone for basic research in cognetics, psychology, or philosophy is always appealing. However, bringing into play the “strange loops” as foundation for an applied research undertaking intended for agent-based systems (ABS), seems still a very risky adventure. Indeed, the need for self-aware agents in workable software could be a challenging topic in any “Achilles-Tortoise” dialogue. More down to earth: is it suitable to consider self-awareness as relevant agent feature when many other – less abstract and elusive – strong agency characteristics (for instance, emotions) are still regarded as luxury, even in current large-scale ABS? In the context marked by the huge potential of broad-band technology (BBT), a prelude answer is:

- *System complexity* makes it *desirable*. A relevant sign that “self-awareness” is currently highly considered in IT was the very prestigious *DARPA Workshop* [12]. Its *Report* [2] summarises: “The vision of a completely general-purpose theory and architecture for self-

aware systems is certainly not yet the state of the art. It is, however, an excellent long-term vision in that it idealizes a strong thread of ongoing activity that is of both theoretical and practical interest. Machines do not need to be self-aware in the same way as humans do, but some forms of self-awareness seem to be useful. [...] Self-awareness can make the system more robust and self-repairing over a period of time.”

- *Agent technology* makes it *possible*. The *AgentLink Roadmap* is explicit [1] : “Computational systems that are able to manage themselves have been part of the vision for computer science since the work of Charles Babbage. With the increasing complexity of advanced information technology systems, and the increasing reliance of modern society on these systems, attention in recent years has returned to this. [...] aspects of these systems include properties such as: self-awareness, self-organisation, self-configuration, self-management, self-diagnosis, self-correction, and self-repair”.

Accepting the twofold claim about desirability and possibility, the next question arises: is such a research *affordable* with quite scarce resources (for instance, within the narrow scope of a PhD thesis [22])? In line with Hofstadter’s ideas that “Consciousness is not an on/off phenomenon, but admits of degrees, grades, shades” [15] the answer seems positive, if the starting point for “strange loops” is Gödelian self-reference (the rationale is detailed in [6]). The overall undertaking regarding agent self-awareness in ABS is presented in [6] from a computer science perspective as well as in [8] in a larger interdisciplinary framework. To increase relevance for e-acting, two more research paths have been added; they concern: one of the most worrying dangers (ethical behaviour of ICTs, presented in [7] and in a related paper) and one of the most uncontroversial application domains (e-Learning, presented in [23]); without them the proposed ways to e-act could not be convincing.

Hence, specific objectives are: a) to defend the undertaking from a (future) “*e-actor*” point of view; b) to set up the background – of the overall undertaking – for starting by Gödelian self-reference; c) likewise, to specify an affordable approach; d) to outline very roughly an experimental model and software mechanisms able to uphold the approach (they are described in other papers). The perspective is twofold, both facets being of cardinal weight for COST 298: *anthropocentric* (substantiated in full scale user-centred development) and *transdisciplinary* (involving e-actors from many area of interests).

As regards the language, for the sake of effectiveness and intelligibility, it is “convenient”, i.e. anthropomorphous, because of the reasons given by McCarthy: “to ascribe *beliefs, free will, intentions* [...] to a machine is legitimate when such an ascription expresses the same information about the machine that it expresses about a person. It is useful when the ascription helps to understand the structure of the machine, its past or future behaviour, or how to improve it” [18]. Moreover, Dennett coined the term “intentional system” for one “whose behaviour can be predicted by the method of attributing belief, desires and rational acumen” [13] (details about the paramount role of the “intentional stance” for ABS are given in [5]). Because of universally increasing complexity the intentional stance is unavoidable. Hence, “awareness” and first of all “self-awareness” should be interpreted only metaphorically.

The rest of the paper is organised as follows: Section 2 details the rationale exposed here, *explaining and exploiting the title* from an anthropocentric perspective. Section 3 is dedicated to the other perspective facet, describing the *transdisciplinary potential and roots* of the enterprise (its subliminal message is a call to transdisciplinary cooperation). On this groundwork, the key feature focused on in the *approach* (Section 4) is affordability (not just inexpensive, but also convenient as tools for e-actors). The approach is embodied in the *generic architecture* of the *experimental model*, outlined in Section 5. *Conclusions* (both general and factual) and directions of *future work* (Section 6) close the paper.

2. Explaining and Exploiting the Title

The Asimov-like title has three undertones: a) “*I*” is the very *core* as well as *expression* of self-awareness; b) passing from “*Robot*” to “*Agent*” may reduce reluctance, since humans are more afraid of force than of intelligence; c) it suggests *Asimov’s laws* (mandatory from an anthropocentric perspective).

a) “*I*”. This word has a huge palette of connotations ranging from the totally irrelevant “*I*” of an answering machine to the still partially unexplained “*I*” of an introspective exercise regarding own perceptual experiences. Indeed: “Research suggests that infants are born with a rudimentary concept of self, manifested in such simple things as differentiating a self-touch from the touch of another. At around 18 months infants manifest a more “conceptual” sense of self, supporting the ability to recognize themselves in a mirror” [2]. Somewhere between those extremes should lie the agent “*I*”. According to McCarthy there is hope that agents could have basic *I*-thoughts, which can generate knowledge: “Developing self-aware computer systems will be an interesting and challenging project. It seems to me that the human forms of self-awareness play an important role in humans achieving our goals and will also be important for advanced computer systems. [...] Self-awareness is continuous with other forms of awareness. [...] It seems to me that the forms in which self-awareness develops in babies and children are likely to be particularly suggestive for what we will want to build into computers” [21]. In IT, (over)simplifying the picture, it can be considered that the most primitive explicit form of self-awareness is self-reference in recursive functions.

b) *Simply Agent*. “With humans the boundary between self and non-self is pretty clear. It’s the skin. With computer based systems, the boundary may be somewhat arbitrary, and this makes distinguishing self-awareness from other awareness arbitrary” [21]. What about bodiless entities? Because of affordability restrictions (complexity, cost-effectiveness, hardware, logistics, research capacity and duration, etc.) robot self-awareness is outside the scope of this research. Moreover, replacing *robots* by *agents* may also reduce reluctance to interact with, since humans (both users and researchers) are more worried about (brute) force than about (primitive) intelligence. Though, to avoid undue agent behaviour, the owner should be able to enter a privileged interaction mode ([7] and a related paper). Nevertheless, the price to pay for this advantage is rather high: “the awareness of one’s own body, involves many specialized sensors arranged into several distinct information systems” and “at this very basic level, self-representation is bodily-representation, and the self is known as, and in terms of, its body” [3]. That means *robots*. The consequences are major (some of them are given in Section 4; details in [6] and in future papers).

c) *The Laws*. Albeit started as science-fiction, Isaac Asimov’s “Three Laws of Robotics” are considered seriously in military studies (even if not following their humanistic spirit in every respect), for instance, in the context of ensuring security of own forces [17]. Even more relevant, they are candidates for formalisation: “The obverse of a goal is a constraint. Maybe we will want something like Asimov’s science fiction laws of robotics, e.g. that a robot should not harm humans. In a sufficiently general way of looking at goals, achieving its other goals with the constraint of not harming humans is just an elaboration of the goal itself. However, since the same constraint will apply to the achievement of many goals, it is likely to be convenient to formalize them as a separate structure” [20].

Finally, the most important innovative IT subdomains have their roots in “*I, Robot*”: “Artificial intelligences such as [...] the embodiment of such beings in Asimov’s robot [...] may [...] provide inspiration for researchers ‘to boldly go where no-one has gone before’. [...] One such line of research is in the realm of affective computing” [24] [4].

3. Transdisciplinary Potential and Roots

The potential is illustrated by examples from three kinds of relevant disciplines ranked relative to their importance to this conference; the roots reflects recent research in the involved area.

e-Activities. For instance, *e-Learning* involves, beside the learning disciplines, *psychology* and *cognetics* – especially when investigating new ways of less algorithmic inductive learning [23]. As regards *Humanities*, the palette is polychrome but strongly related to one of the conference strands are transcultural interfaces with a significant non-textual communication component, based on (partially) visual ontologies [10].

Social Sciences. Self-reference becomes a key concept in the sociological discourse, although intense opinion diversity as regards information, communication and meaning in social systems [16]. On the other hand, because of the major trend to use extensively agents in almost every IT subdomain, artificial intelligence becomes an IT infrastructure component rather than a definite conventional subdomain. However, a much less acknowledged consequence is the need for artificial subspecies of social sciences, like *psychology* and *sociology*, to be able to redress the balance regarding the role of users in the design of anthropocentric interfaces (affective computing is just a blatant example [4]). On the other hand, widespread autonomous and non-deterministic artificial entities increase dramatically the role of (un)ethical behaviour of software components [7].

Metasciences. This fuzzy umbrella term is used here as a category name for the disciplines linked to epistemology. For instance, the research described in this paper is implicitly linked to the *general theory of systems*, *(meta)mathematics* and *logic* [6] [8]. Even more conspicuous is transdisciplinarity where logic has a major and explicit role (e.g., when tri-valent logic is used to handle uncertainty [9]). Moreover, domains as *complexity science*, in embryo until a few years ago, could take off mainly due to the BBT potential: processes like emergence or self-organization in (natural or artificial) ant colonies, cardinal for both science and technology, can be easily modelled due to the big number of simulation instances, affordable because of the computing power now available [11].

4. Approach

To be workable, the approach should be based on backing up the aspects focused on in the aims and rationale of the undertaking and on integrating them into a viable generic architecture:

- *Anthropocentric perspective* means here full scale user-centred development, from conception to experimental model, with special emphasis on *ergonomicity*. Agent *autonomy* can be seen almost as a corollary: unable to manage the system complexity involved by current IT applications, humans must transfer most of this complexity to the system – primarily its cognitive component is addressed: “easy to understand, easy to use”. Hence, such a system must work more and more in an autonomous way. There are three main sources autonomous behaviour stems from: living beings, automata, and software. As regards software, in modern IT autonomous adaptive behaviour stems mostly from combining biological and engineering mechanisms [12] and is implemented in ABS [1]. (Details about anthropocentric interface design are given in [5].)

- *Affordable* means not just inexpensive, but also convenient as tools for ordinary actors in the broad-band society. Here “actors” refers to both end users and application developers.

On the other hand, to be convincing, the problem chosen to illustrate BBT potential must be *challenging*: innovative, difficult, controversial, provoking, and so on. Since self-awareness is a human feature par excellence, agent self-awareness is a good candidate to accomplish the task. Nevertheless, when the emergence of self-awareness is expected from Hofstadter’s

ideas about “strange loops”, there is a significant risk that the candidate could become “too good”, i.e., the target could be too far to be affordable in the sense delineated above. Thus, preserving affordability implies:

- *“Plan B” framework.* To save the undertaking as applied research when the basic research target is hard to reach, a “Plan B” is mandatory for real-world application domains: the self-referencing agent must be able to function also in a ABS as an implementation mechanism for conventional architectural features.

- *Stepwise Proceeding.* For both theoretical and practical reasons the approach is based on “micro-continuity”. Indeed, inspired by Hofstadter’s idea that consciousness emerges gradually, a stepwise proceeding is safer and cheaper. This incremental nature of self-awareness, allows starting with few features and going on step by step. That involves successive prototyping, in this case, experimental models and dedicated software mechanisms. (Details are given in [6].) Hence, initially the architectonics should be embodied by a *human-controlled self-referencing interface agent, of reduced cognitive complexity* (a very “small soul” [15]).

- *Modularity.* This macro-feature – already common place in agent-oriented software engineering – is here necessary also for research reasons: micro-continuity implies incrementally extendable functionality of the self-referencing agent. Thus, both transdisciplinarity and affordability are boosted.

- *Adequate Extensions.* The generic architecture should allow easy extensions for “vertical development” (new functions, e.g., switching between various ethical behaviours) as well as for “horizontal development” (new application domains, e.g., less algorithmic e-Learning). Therefore, modularity is a prerequisite.

- *Secure owner control.* The privileged interaction mode mentioned in Section 2 enables the user to take control, deferring agent intentions – or even agent evaluations.

- *Human-compatible knowledge representation.* Agent must interact with humans in human ways (for interface agents it is their very *raison d’être*). For both theoretical and practical reasons, propositional communication is highly desirable and almost unavoidable. The reason is a speculative “author thesis” [9]: in interacting with their interface agents, humans prefer symbolic communication but would like that their possible sub-symbolic response should be perceived too. Hence, the agent ontology (in its original meaning, i.e., their sketchy world representation) should comprise: *I* (software entity), *You* (master), and *Rest of the world* (context-relevant environment). A vital aspect is to ensure what McCarthy defines as “elaboration tolerance” [19]: “A set of facts described as a logical theory needs to be modifiable by adding sentences rather than only by going back to natural language and starting over. For example, we can modify the missionaries and cannibals problem by saying that there is an oar on each bank of the river and that the boat can be propelled with one oar carrying one person but needs two oars to carry two people. Some formalizations require complete rewriting to accomodate this elaboration. Others share with natural language the ability to allow the elaboration by an addition to what was previously said”. This will be the main premise for designing agent dynamic ontologies.

- *Affective computing.* Again, there are both theoretical and practical reasons: a) To catalyse the emergence of self-awareness, agents should manifest stepwise human-like behaviour. Here micro-continuity can help since not the *antropomorphic feature* itself has to be replicated, but its *appearance* – firstly forged, later more genuine [4]. A cardinal such feature is emotivity. (In fact, the role of affective computing is much more wide-ranging [24].) b) Many ABS involve persuasion. For instance, teachers – and coaches even more – to be effective must be convincing, first of all credible; however, that means to deal with emotivity. (The influence of affective processing in education and training was reemphasised in [23].) Hence, self-referencing agents should be able of emotional reactions.

- *Spaceless agents.* As shown in Section 2, because pure software agents lack the awareness of their body, they cannot have any sense of space (crucial for the self-representation

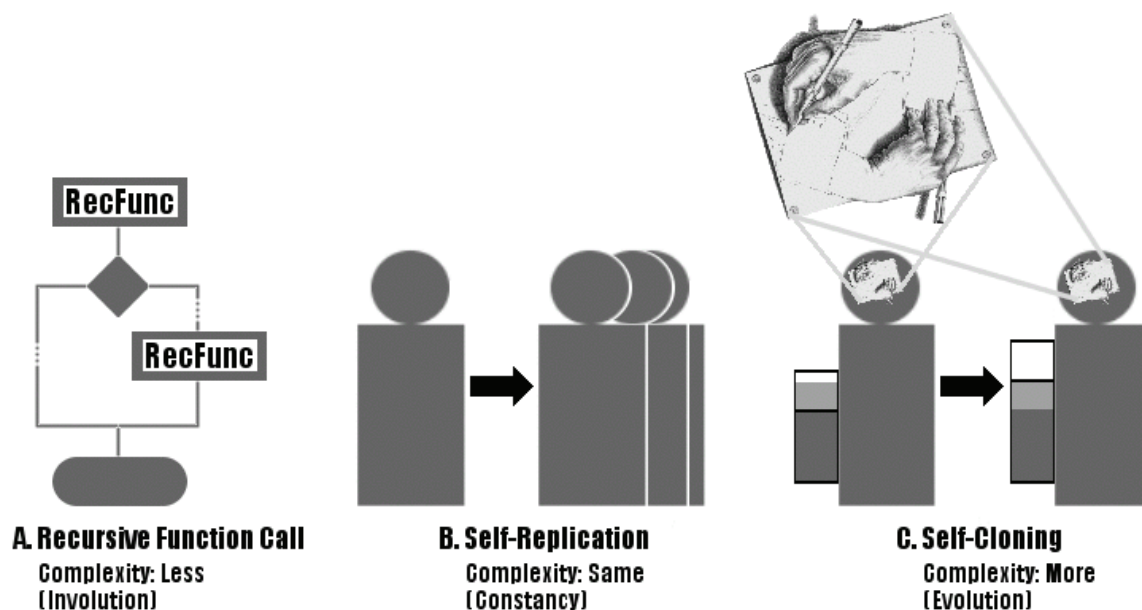
achievable by robots). To compensate partially the major drawback that bodiless agents are also spaceless, such agents should be designed with a considerable sense of time; of course, agent time (and the logic governing it) should be as close as possible to human time [9] and ontologies have to mirror it (for instance, containing rules for active waiting and for changing priorities). (Details are given in [6].)

Finally, since the broad-band society involves (inter)acting in open, heterogeneous, dynamic and uncertain environments, agents – no matter how affordable they are – must adapt to such environments. That means that they: a) are real-time beings, since the agent is a process (recently defined as such by a formal standard [14]); b) have to deal with uncertainty; c) must be highly reactive (most of them driven by environment stimuli); d) must be proactive too, showing flexible initiative. (Details are given in [6].)

5. Generic Architecture and Experimental Model

The model walks *The Road to Self-Awareness* described in Fig. 1. It shapes very roughly and features the basic mechanisms to achieve gödelian self-reference though self-cloning. The model is described in more detail in the context of an application in [23].

Fig. 1. Self-Reference, from Call to Awareness.



A. The first step towards self-reference is the *Recursive Function Call*. In this case, the problem that needs to be solved becomes simpler with every call, hence the complexity decreases.

B. When considering *Self-Replication*, the agent is able to cast a carbon copy of itself. In this case, the complexity remains unchanged, the new agent being neither smarter nor dumber than the previous one; it is able to solve the same problems and/or handle the same situations as its predecessor. Albeit not achieving an improvement in performance, self-replication is a vital step towards the goal.

C. *Self-Cloning* is used as mechanism to implement gödelian self-reference. The agent casts an improved version of itself, a “slightly altered alter ego” in opposition to the “carbon copy” from the *self-replication* process. The agent decides when it has achieved crucial information

(after a learning process) and clones itself into a smarter one, than that embodied previously. The complexity increases, as the new agent is more skilled than its predecessor. The improved “silicon copy” replaces the initial agent and the learning process may start over again. This is how the model evolves, increases in skill and is able to handle more complex problems.

6. Conclusions and Future Work

Considering the two-level target, the assessment involves both facets: A) *general* conclusions (regarding the *BBT potential* for developing new ways to “*e-act*”) and B) *factual* conclusions (evaluating the *research undertaking* chosen to illustrate this potential).

A1. BBT allows full scale user-centred development of cognitively *complex*, conceptually *innovative* and practically *affordable* application domains.

A2. Such applications are able to become convenient tools for ordinary e-actors.

A3. Since the broad-band society involves (inter)acting in open, heterogeneous, dynamic and uncertain environments, conventional approaches to ICT development become ineffective and should be replaced by new ones (for instance, agent-oriented software engineering).

A4. However, to get acceptance among prospective e-actors, any application – no matter how advanced is the technology employed – must be approached in a genuine and intensive transdisciplinary manner.

B1. From a computer science perspective it is much too soon to claim that agents achieve self-awareness through Gödelian self-reference *per se*. Nevertheless, indices are rather encouraging.

B2. On the other hand, from an agent-oriented software engineering perspective, self-referencing agents provide a workable mechanism for improving agent architecture. (“Plan B” is proved viable.)

B3. The main hindrance imposed by affordability restrictions is the purely software, bodiless, agent nature. To diminish it, the main feature added to usual interface agent architecture is a primal sense of time.

B4. The current agent endorses the model, the approach and, mainly, the anthropocentric perspective.

B5. Being yet in an early stage, the approach could be convincing only if similar self-referencing experimental models are applicable both vertically (i.e., solving key architectural *problems*) and horizontally (i.e., building up applications in well-known *domains*). The *problem* chosen is a deeply worrying one, not only for agent-based systems but for any advanced ICT: controlling the ethical behaviour of artificial entities. The *domain* chosen is very familiar: e-Learning.

As regards future work, it is outlined in the stepwise approach: a) the expected emergence of a primitive “I” should be catalysed through a powerful temporal dimension and an emphasised less algorithmic behaviour; b) improving agent architecture, first of all its dynamic ontology and its reactivity (it should be much more stimulus-driven).

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Communication-Wear: User Feedback As Part Of A Co-Design Process

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Abstract

Communication-Wear is a clothing concept that augments the mobile phone by enabling expressive messages to be exchanged remotely, by conveying a sense of touch, and presence. It proposes to synthesise conventions and cultures of fashion with those of mobile communications, where there are shared attributes in terms of communication and expression. Using garment prototypes as research probes as part of an on-going iterative co-design process, we endeavoured to mobilise participants' tacit knowledge in order to gauge user perceptions on touch communication in a lab-based trial. The aim of this study was to determine whether established sensory associations people have with the tactile qualities of textiles could be used as signs and metaphors for experiences, moods, social interactions and gestures, related to interpersonal touch. The findings are used to inspire new design ideas for textile actuators for use in touch communication in successive iterations.

Keywords: Smart textiles, wearable technology, touch communication, clothing and emotion, user research, prototype as probe.

Introduction

With the downscaling of traditional textile industry in the EU, it is envisaged that, in Europe, a high-tech clothing sector will soon emerge [1]. First applications have already surfaced in the area of sports and health [2]. Looking further out into the future, it may only be a matter of time before some of these wearable and smart textile technologies are adopted within the fashion industry. However, as yet it is unclear what kind of compelling applications might accelerate the uptake of smart materials in the consumer market [3]. Fashion is uniquely placed as a future mediator of technology, in particular within the relatively new "experience economy"; a culture where the human senses, experiences, and emotions are more and more of commercial interest. The *Communication-Wear* concept seeks to operate within, and contribute to, the emergence of a new genre in clothing and fashion, where fashion and ICT converge. This research is multi-disciplinary, drawing on expertise from fashion and textile design, electronics, wearable computing, and user research.

Thus, *Communication-Wear* proposes to marry conventions and cultures of fashion, as being an expressive medium that connects people with the social world, with principles of nonverbal communication as well as with current cultures of mobile communications.

Fashion/clothing and mediated communication technologies have common attributes in terms of how they enable people to construct an identity, to be expressive, to differentiate themselves, and declare their uniqueness, and which enables communication between people allowing them to form communities. People do this through their consumption of these commodities and services. The communication of identity through fashion can be to one's self, or from self to others, the meanings behind which are often ambiguous and open to (mis)interpretation [4]. A large percentage of face-to-face communication takes place via nonverbal means, i.e., through facial expressions, touch, and bodily gestures [5] and the links between expression and nonverbal communication through body movement and touch in human communication have long been identified [6, 7]. Morris [8] for example distinguishes: *Affect displays*, movements of the body and face to show emotion; *illustrators*, gestures which help to reinforce verbal messages; and *auto-contact behaviour* or 'self-intimacies', which are *'touching actions we direct towards ourselves that provide comfort because they are unconsciously mimed acts of being touched by someone else'*. Mobile phones are already *'affective technologies – that is, objects which mediate the expression and exchange of feelings and emotions'*. [9] *'However, a significant amount of human expression and interaction information is never captured, transmitted, or expressed with current computer mediated communication.'* [10] The design framework for *Communication-Wear* [11] is informed by these diverse strands of research.

Rheingold highlights how the notion of “killer application” is outdated and too narrow, stressing the importance of lifestyle research [12]: *'The killer applications of tomorrow's mobile infocom industry won't be hardware devices or software programmes, but social practices.'* Our research locates potential youth groups at the centre of the development of fashion/clothing prototypes by engaging them as co-developers and evaluators using design-led techniques, in order to determine what and how people might communicate through augmented clothing, and how this might fit in with, and support people's everyday communications.

We developed a smart textile system integrated into prototype garments that provides a *menu* of touch expressions encompassing 'hug' and 'stroke', gestures that the garment can sense and actuate. In a way we used the prototypes as a research probe as a means to create conditions in which participants could experience, play and dream, possibly gauging a deeper level of knowledge or tacit knowledge about user's desires, preferences and behaviours, as well as the way the product or experience makes them feel. Our approach aims to gain insight into what some catalysts and drivers of future consumer fashion wearable technology that permits touch communication might be, and to explore methods to design *smart* clothing that is active and dynamically changeable, which people can appropriate. In order to do this we have conducted a series of studies using probes to gain insight into how people might appropriate the functionality and create their own meanings through visual, aesthetic, and/or tactile codes, much like they do today with their own clothing. One aim was to determine whether established sensory associations people have with the tactile qualities of textiles could be used as signs and metaphors for experiences, moods, social interactions and gestures, related to interpersonal touch. This is the second in a series of user studies, which forms an integral part of an iterative design process.

Related work

There is no shortage of technology explorations in this area. Work in the area of remote communication through touch includes 'ComTouch' [13], a vibrotactile communication

device, which augments remote voice communication with touch. The 'Lumitouch' [14] system consists of a pair of interactive picture frames. When one user touches their picture frame, the other picture frame lights up. 'InTouch' [15] is an internet-based concept that aims to create the illusion that two people, separated by distance, are interacting with a shared physical object. *CuteCircuit* is developing its 'F+R Hugs' [16] into a commercial offering. 'TapTap' [17] is a wearable haptic system that allows human touch to be recorded, broadcast and played back for emotional therapy. Our approach differs in the sense that we have elicited and systematically analysed user feedback with the view to inform or inspire designers of fashion from a social science angle.

Communication-Wear design framework

We have taken a design-led approach in this research, as we are proposing artefacts for consumption. Design is at the interface between technology or material and the consumer. As we are dealing specifically with wearable technology, fashion and textile design methods play a key role in our process.

The point of departure for most studies of dress and fashion is the consumer culture, a cultural system of making meaning, and of making meaning through what we consume. Consumer culture is, what Raymond Williams [18] and other writers have called, the "*bricks and mortar of everyday life*", the music you listen to, the clothes you wear, etc. These are all aspects of material culture, which most studies of fashion draw on to look at the way we use it to map out identities for ourselves. Those identities are often equivocal and unclear in their signals. "*Fashion, clothing and dress constitute signifying systems in which a social order is constructed and communicated*". [4] Meanings can also be generated as a result of negotiations between people resulting from their joint actions, e.g., communication as social interaction through messages [19], which constitutes an individual as a member of a group. In the Semiotic (or Structuralist) model of communication as identified by Fisk, "*it is the process of communication that produces or generates meanings*" [4], in which both sender and receiver are constituted. The designer can be the source of the meaning of the garment, "*a product of the designer's intentions, where intentions are defined as a person's thoughts, feelings, beliefs desires about the world and the things in it*". [4] Similarly, wearers can attribute their own meanings to the garment, thereby expressing their own beliefs, hopes and fears "*through their use of the garment*" [4].

Textiles have a range of tactile qualities, which textile and fashion designers have always exploited as part of their design method to engineer a look, concept, mood etc. There are well-established descriptors for the sensory associations and *hand* qualities of textiles used in the fashion and textile industry as part of the selection process when choosing a textile for a particular clothing application. There is an industry-standard set of bi-polar attributes for fabric hand, e.g., smooth-rough, soft-crisp, cool-warm, delicate-coarse, hard-soft, etc. There are also surface attributes that include sticky, slippery smooth, greasy, fluffy, granulous, scratchy, hairy, etc. These have been developed through using subjective assessment tests by experts. The descriptors along with other attributes, such as colour, shape, and pattern, are used by fashion designers as a legitimate design method to develop seasonal design collections. The collections can then become trends or genres, which are generally understood in terms of their meanings, as they are a result of fashion production and other forms of cultural production, e.g., media and graphics.

In the same way that youth groups create new languages using SMS, so *smart* clothing will need a design palette or *language*, which users can co-opt, adapt and assign their own meanings to, or make their own meanings with. A range of textile actuation types such as shape change, light-emitting, and tactility, has been designed during the course of this research. The aim of the user studies is to determine whether established sensory associations people have with the tactile qualities of textiles could be used as signs and metaphors for experiences, moods, social interactions and gestures, related to interpersonal touch. By enabling users to feel or experience these sensations, they will be engaged in deeper levels of discussion about their associations, thereby revealing insights into how they would make their own meanings, develop their own language to communicate and express using this sensory textile language.

The first author designed the garments and their textiles according to these sensory associations and design principles, as well as drawing upon her own experiences and associations. Designers often draw from their own experiences. In a first iteration, the touch actuation consisted of heatable textiles, textiles that change from being cool to warm upon receipt of touch communication. A fabric that has a warm handle is generally understood to have comforting associations; synonyms include having or displaying warmth or affection, passionate and psychologically warm, friendly and responsive, caring, fond, tender. If a designer were devising a fashion collection, he/she would start with a concept board that communicated the mood on a visual and tactile level. If a key component of the collection was a *warm* mood, the designer would include in his/her concept board swatches of fabric that were warm to the touch, a warm colour palette, as well as images or photographs which communicated a sense of warm. The selection of swatches and images would be informed by established cultural understandings of them, as well as the designer's experience of these cultural associations. The author employed a heatable textile as a means to engender these feelings in a person when receiving touch messages. The placement of touch actuators, i.e., heatable textiles, is informed by a 'vocabulary of touch' as devised by Argyle [5]. The actuators were placed on the upper back, and front of left and right arms.

Prototype technology platform

In a first exploratory study aimed at mobilising participants' tacit knowledge and their associations of touch and gesture with respect to codes of our material culture, in this instance, textiles and clothing. We generated insights and inspiration for new design ideas around touch communication, and representation, simulation of touch gestures. The main concepts of the study were: A broader range of sensory capability, i.e., the ability to sense and exchange more sensations; to explore the idea of tactile change to represent touch, not just warming sensations; and a visual representation of touch to include colour and/or light. These findings have been used to generate a new conceptual design for the next iteration of *Communication-Wear*, used in the study reported here.

The initial stages of development of the technology platform of the prototype have been reported in a separate article [20]. In short: Each garment is twinned with a mobile phone via Bluetooth. Communication between garments takes place as follows: Both the sender and the receiver (wearer of the garment) carry a mobile phone. A text message from the sender's mobile phone sends an instruction to the receiver's Bluetooth-enabled mobile phone. This then sends an instruction to the recipient's garment. Users can also send touch messages by gesturing them, as opposed to using text. Textile gesture (mechanical stretch) sensors were located on the upper back where the arm joins the trunk of the body, and touch sensors were

situated on the lower parts of the sleeves [20]. Galvanic Skin Response (GSR) sensors were also introduced, which were integrated into the lining of the garment looping around the index and second finger on the left hand. Woven textile circuits carried power and data signals.

Actuation of *hug* messages took place via the generation of a warming sensation using heatable textiles, symbolising the warming sensation felt when touched by another person. The heat pads were located in the upper back of the jacket (on the shoulder blades, figure 1). When a hug or embrace gesture is sent, the heat pads in the back of the jacket heat up.

A tactile actuator that attempted to simulate a *stroking* sensation was engineered using shape memory alloy wire and a pleated fabric insert. This pleated insert was located on the inside of the lower part of the sleeve so that it would slide against the topside of the lower part of the arm (figure 2). The placement of these actuators is informed by Argyle’s ‘vocabulary of touch’ [5].

Figure 1. Prototype jacket (left), inside the jacket, showing the heat pads (right)



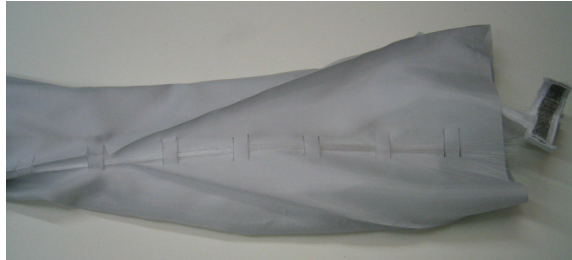
Figure 2. Stroke actuator inside sleeve (left), detail of touch sensor integrated into the sleeve (right)



Fibre-optics (figure 3) were engineered into the garment on the underside of the sleeves. Thus, a subject by hugging themselves and stretching the mechanical stretch sensors was able to deliver a warming sensation to the upper back of the partner. An arm stroke by the sender was received as pleated fabric being drawn up the arm. The recipient receives the touch message through actuation, as well as an SMS confirmation, saying ‘hug shared’, or ‘left touch shared’, etc. In addition, physiological arousal, as detected by the GSR sensors, was relayed to the partner by light being emitted from the fibre-optic section. The GSR took the form of textile electrodes integrated into a semi-glove configuration at the end of the sleeve in

the garment, which wrapped around the index and second finger. GSR can detect levels of arousal; it cannot detect emotion on its own, but would need to be complemented with other sensor readings such as respiration, heart rate, etc. Using the GSR fits in well with the aims of the user study, in that we are not conducting a scientific experiment on the functionality of the GSR, but we are trying to create conditions in which participants can experience and *feel* the functionality afforded by the technology.

Figure 3. Light-emitting fibres integrated into the sleeve with GSR sensor at the end of the sleeve



User feedback

Four pairs of participants took part, a total of seven women and one man (aged between twenty and twenty-five), who were recruited locally (in Bristol). The pairs of participants were briefed on the functionality of the garments, which was also demonstrated to them. The participants then spent a period of time exchanging sensory messages or touch communication. Participants were not able to see each other, as they were separated by a partition in the lab. Afterwards pairs were interviewed together. All sessions were video-recorded and transcribed.

The aim of the study was to try to elicit from participants how they made sense of and interpreted the tactile sensations, in relation to their own perceptions of touch. Through having experienced the tactile sensation in relation to its given meaning, participants were asked to describe and articulate the particular qualities the sensation engendered, and compare those with their own experiences and associations. Participants were also asked to relate their experience with the prototype to their current mobile phone communication practices. During the interview we gauged how users experienced the sense of touch or presence, how they related this type of communication to their current communication practices. In addition we asked them to think of other tactile actuation types that would engender such a touch or presence.

Sensations of touch or presence

Some participants thought that the stroke actuator was ‘creepy’, saying that the creepiness was due to there being a feeling of the presence of someone, even though no one was there: *“When you feel something, and you know the other person is doing something, it does feel quite nice.”* *“It felt like I was making a connection with someone near me.”* *“Felt a bit creepy ... felt quite pleasant, but creepy because you felt someone but was there, but there was no one present.”*

A couple said that the feeling was akin to a spider or insect: *“It (sleeve actuator) did not feel like someone was stroking my arm, it was more like a spider.”*

And some thought it was too subtle to make a judgement upon: "... was very close to a real brushing sensation. It was quite weird." "... it gave me a feeling of electricity going through me ... a warm and tingly feeling."

The heat pads as metaphor for an embrace touch worked for some: "The heat worked as a literal, and an abstract. You would of got the idea that someone is doing it to you ... the heat on the back." "The heat thing I liked, a bit like a hug; I felt my whole body heat up."

One was unsure: "I don't know whether I would think of it as a hug, but as heat being produced, sent from one person to another, it would have an effect on me."

The heat pads as metaphor for an embrace touch was thought to be largely dependent upon the location in the garment; with some subjects stating that it would be more effective if located on sensitive areas of the body. The feelings these sensations engender are largely socially constructed: "I know that I'm not the only one that feels consoled by a hand on my lower back ... everyone that knows me well, would know that that means more to me."

"I think they (the heat pads) could come-in more (further down the jacket) ... the heat kind of wraps around you.

If there were heat pads on my lower back then I would feel an embrace; that would be something that I would respond to." "... something that could be quite intimate, heat travelling up/down your spine ..."

The majority of participants had a clear preference for the light-emitting fibres. The GSR sensors linked to light-emitting fibres represented an interesting difference between doing something that is intentional (touch), and doing something that is unintentional. They liked the concept of knowing how the other person was feeling through the GSR sensors, a kind of subliminal messaging and mood sensing: "What was most intriguing was the fact that she's having a reaction; maybe it's not to me, that doesn't matter, it's the fact that it is very personal to see someone's sweat represented by light. It is a personal or intimate thing." "The reason why I like the lights is because it's about how someone is feeling, excited ... it's more than a physical reaction."

There were comments indicating that the light-emitting fibres were preferable to other types of actuation as it is not something we would normally have access to, whilst the other types of sensing and actuating are trying to replace something we do have access to when face-to-face: "... it's because it's something that you would never know; you can't read people's reactions in that way; you would never know someone's personal reaction (under normal circumstances), and then suddenly you can read it, it lights up, it's really in your face, the glow. I think it's that contrast between not knowing and then suddenly knowing; and you are the only one who knows." "What intrigues me is that it's (GSR and fibre optics) not trying to replace something else, because it's something unique."

Most thought that seeing what was happening to the other person, "communicating through your body", would make them feel closer to that person: "I like the idea of people's feelings being communicated."

The majority of participants stated that they would like to choose the location of actuators in the garment, as well as type of actuator. This was expressed from both a sender's and a recipient's point of view, as it might be a good mechanism for maintaining control and ensuring privacy by being able to make their own meanings. "The absence of a meaning of

what that (the light-emitting fibres) meant would be difficult for me.” For example, one respondent said they would like to be able to choose the location depending upon their knowledge of the recipient, or pressure points. This would enable users to express a shared understanding of each other, which would not be unintelligible to onlookers: *“I thought the location (of the fibre optics on the underside of the sleeve) was good, because this is the most emotional part ... this is something that is connected to my body, and it’s not visible, it is private, for me.”* *“You would want certain key words, like you could put your phone on ‘flirt’ mode and certain words or actions would trigger a ‘hug’ To have words that triggered emotions, feelings. You could assign certain key words to the function in the garment.”*

Even though there is a limited range of actuator types, some subjects suggested that people might simply “re-programme” themselves and adapt. Similarly, a number of subjects thought the actuation strange at first, and stated that once they knew what to expect, such communication may become an accepted part of people’s communications practices: *“I think that you develop your own language. You would re-programme yourselves to make associations with the different types of actuation ... you would end up knowing that that feeling would be someone sending you some love.”* *“...people would think ‘oh you are wearing a funny interactive broche’, but actually you have just sent something to your friend and they got really excited”,* as it wouldn’t mean anything to people outside of their group.

With regard to issues of privacy, the majority of subjects said they would like to be in control in relation to the people they are exchanging messages: *“If you were on the phone you could see a physical reaction of what someone just said. I don’t think that would be too intrusive ... that would be a good option on the phone ... but I would only want to communicate with certain people.”*

Relating this type of communication to communication practices

Comments indicated that it could be used in a similar way to text, or used to augment text. Participants related the use of emoticons in text messaging with tactile communication in on-going conversations, as *“in a text message you can’t really read into emotions”* *“... the fibre optics in conjunction with words or texts would definitely work for me, because it is such an intimate thing; I can imagine doing that. ...but it would have to be used in a similar way to text, where you always know you might be wrong, you might misunderstand this person... words can be used in so many different ways.”* *“... if my partner says “I look forward to seeing you”, I send him a ‘face’, I don’t say “yes, I’ll meet you at blah, blah”, I send him a ‘face’. “It would be nice if, at the end of a text, you would get a hug.”* One participant suggested that touch communication might work for her as *“I am a very tactile person”,* text is cold and impersonal: *“When you are speaking you have tone of voice, whereas in a text you can’t really read into emotions.”*

The majority of participants thought that it would be something they would use remotely, over distance, and not with people who are in the vicinity: *“If it was discretely telling you that you had a phone call, like as if there was something pulling on you ... a subtle signal as opposed to your phone vibrating.”* *“Say you both are going into a similar situation, for example, shopping, and you are both wearing the jacket – and you get separated for 6 hours or so, you could communicate to each other and send each other messages about how you are feeling.”* You can express yourself, you can touch the people you’re with: *“What is attractive about this, is that you are doing your normal day stuff and suddenly you get something which*

is of a different nature than what you would expect, because it has been sent by somebody who is somewhere else.”

The idea of using it in a disco-club context arose, in which case subjects thought that this would be a novelty, or lessen its meaning, for example, using it as a means to flirt or tease other people: *“More of a novelty in that context – discos would be fun. I wouldn’t send a text in a party – but if you knew someone was at a party it would be fun to tease them.”*

Participants thought that simply being able to sense someone’s presence would have significant value: *“Just the fact that you are linked, you are communicating through several senses. When you are facing someone you have visual, tactile, spoken word, etc. And when you are remote you can’t see that person all you have is text, spoken word, but if you can see things are happening to this person at the other end, you feel closer to that person.”* *“If you did it in a certain situation, when you know they would need support.”* *“I think distance would be a good context in which to use it. It would be an emotional thing ...”* *“Family, friends – they do like to know that you are all right ... easy way to say ‘hi, love you’.”*

The difference between doing something intentional (touch) and unintentional or uncontrollable (GSR), that this clothing concept encompasses, was discussed, and in relation to that the issue of context awareness and a system that had the ability to learn about someone’s patterns of behaviour: *“It would be good if you could move it around, depending upon what you’re doing.”* *“... when you are watching films.”*

One or two participants said they might use it when the person with whom they are communicating is in the same space, or nearby, a kind of *“wink, wink, nudge, nudge”* communication: *“If you see your partner on the other side of the room, you can communicate what you are feeling ...”*

One participant suggested that they wouldn’t use it in conjunction with text or voice communication: *“I would use it more after I hang up to show that I was still thinking about them. I am acknowledging about what we just talked about.”*

Conversely, most thought they would use this communication as a means to console or support someone in a way they would when face-to-face, and/or in conjunction with voice communication: *“That (touching) is something you do automatically when someone is upset. So it would be nice to be able to do that to someone when you can’t be with him or her”* *“If someone were distressed you would send him or her a hug in a certain situation when you know they would need your support.”* *“When you feel very low or happy – important to receive that signal, that you know you are not alone.”*

The study pairs were fairly evenly split on the issue of the people with whom they would communicate in this way. All participants stated that they would want to be in control over whom they had this kind of communication with. Approximately fifty percent of the pairs said they would only communicate in this way with partners or close friends, and not close family, i.e., parents or children. This group suggested that it would be with people with whom they have an intimate relationship such as a close friend; and maybe for people who don’t have an established level of intimacy with their partner, but are aspiring to it: *“Someone that I had an intimate relationship with, and it was quite new, that might work, or a very good girlfriend, or male friend; someone who you are close to, but not as intimate as with your partner.”* *“It would feel wrong if it was with someone in my immediate family.”* *“My kids*

would use this for sure, more so the girls than the boys. They are very touchy amongst their girlfriends.”

Whilst the other half stated the exact opposite: *“The problem is that I am separated from my family; it would be great to feel that someone is close to me.”*

A number of participants thought that this type of communication was a natural progression for the mobile phone. However, participants generally said they wouldn't want this type of communication all of the time, suggesting that it would be strange at first, but they could imagine that that perception might change. They equated this view with the mobile phone phenomenon, and the resulting impact on social norms, suggesting that if this concept becomes an established part of people's communication practices, then their frequency of use might change. It was largely thought that this concept would be a novelty unless it was widely accepted: *“(The mobile phone is not a gadget to me) ... anymore; it was at the start, and that's because it would be if only a few people had them; but obviously, everyone has got them now; it's become a necessity.”* *“The more widespread it is, the better, as you wouldn't want to share this with just one person.”* *“It was strange at first; don't know what you are going to feel ... once you got use to it, it is ok. I didn't know what I was going to be feeling, the not knowing ...”* *“You would sort of re-programme yourself to make associations with the different types of actuation. If those things became part of clothes and mobile technology you would end up knowing that that feeling would be someone sending you some love.”*

Participants were asked if they would feel conspicuous gesturing to send messages in public spaces, which was discussed in relation to current cultures of self-touching, and nonverbal communication: *“Depends, I mean everyone is talking into headsets now, before I thought it looked odd. The more widespread it is, and then it becomes normal. Perhaps we will see everyone doing this in the supermarket.”*

Other tactile actuation types engendering touch or presence

One study pair talked about the 'goose bump' effect, saying that touch should arouse the user in some way, whilst another talked about tickling sensations, suggesting that sensitive parts of the body could be targeted: *“Goose bumps, that's what I'm always after; you know when your mum brushes your hair, or when you're trying on different clothes, a piece of music it's kind of intimate, but it's kind of nice ... it's like a tickling feeling.”* *“Stroking would be the nicest, if it generated a tickling sensation ... then it's a real touch; fabrics that are moving on top of each other, that is what tickles.”*

One or two participants said they would like to receive visual messages that communicated someone's mood: *“If you could tell through what you were wearing how your friends were feeling. Like it would come up they were feeling anxious so you could send them a hug.”* *“I think a mood thing ... a colour spectrum maybe ... of whether someone is anxious or happy.”* Whilst one participant went even further: *“I was thinking about smell, which is pretty important ...”*

This would probably be limited to a small number of aromas. Participants suggested that it would be valuable to build-up a repertoire of possible complements that might be used in particular situations, which was related to text messaging, where there are *“endless combinations”* of words available to us that make it *“a universal thing”*: *“... we have such high expectations of technology now; I think we are so spoiled with so much technology that I*

think the key to success with this project is its multiplicity. It would have to have a wealth of combinations, almost like words; of course, that is unachievable, but as many different levels or levels of intensity, or combinations, that you could possibly imagine.” “Would be interesting if you combined the stroke with the heat, like a real hand, touching ... that would be my preference versus something that is changing colour, light – something visual.”

The participants were asked whether they favoured literal representations, where actuators could yield a pressing or contracting sensation, or more metaphoric ones. They were also asked what came to mind when they thought of touch: *“The feeling you get from someone you love, you get instantly – literal would be better. Abstract is very personal, more difficult ...”* *“The pressure with the ‘hug’. Handholding – pressure and presence. Squeezing, reassuring feeling. A hand on your shoulder, a sort of ‘stop’, calm down, you’re ‘ok’ feeling.”* *“Pressure is an important thing ... even if there was a band that would contract.”*

Participants were also asked if they would favour an abstract or arbitrary actuation, such as a flower that would open its petals upon receipt of a message. None of the participants favoured this.

Discussion

This study elicited user feedback with respect to smart textiles and clothing: To determine whether established sensory associations people have with the tactile qualities of textiles could be used as signs and metaphors for technology mediated experiences, moods, social interactions and gestures, related to interpersonal touch. We generated insights and inspiration for new design ideas around touch communication, and representation, simulation of touch gestures. In an iterative design exercise, we integrated design recommendations from a first study into the prototype used in the current study. We included a number of new textile sensors in the second iteration, namely galvanic skin response (GSR), touch, and gesture sensors. The touch and gesture sensors would enable users to exchange messages through self-touching. GSR can detect levels of arousal, which yielded interesting results as a kind of *subliminal* messaging, in comparison to the apparent *control* of touch and gesture sensors. The GSR sensor linked to a light-emitting textile actuator was undoubtedly favoured by most of the study pairs, as they liked the idea of feelings being communicated. The GSR was not viewed as trying to replace something we have when face-to-face, such as touch; it provides information we might never gain *even when* fact-to-face. The GSR represented an interesting difference to the touch and gesture sensors to participants, in that it is automatic and uncontrollable. Even though people can engage in self-touching, which is also unconscious (and can be viewed as mimed acts of being touched by someone else, and possibly indicating a desire or need to be touched), perhaps participants were not aware that the other sensors could be just as subliminal.

In response to the issue of a physical pressing or vibration sensation being *“more like something real”* from the first study, we included a shape-shifting textile actuator that moved up and down the arm, to represent a stroking action. We, again, based the design of these actuators on textile sensory descriptors, namely a silky-soft textile. It was interesting to see how participants compared the warming actuation with this shape-change/shifting actuation. It was largely felt the stroke actuator was too subtle, *“like an insect, barely touching”*, and the frequency of movement was too sudden to reflect an empathetic touch. Only one participant said that this actuator was like a real brushing sensation. Participants were equally divided on

the issue of the heat actuator, with one half saying that they liked it and that it engendered a feeling of touch, and the other half saying that it was weird, strange and unusual.

In response to the suggestion that colour or a visual display might be a “*bridging*” step between voice and text communication and communication of physical sensations, we included photonic textiles as a symbol or metaphor for a participant’s arousal, sensed by the GSR described above. This is a very different actuation compared with the touch actuations, one being intimate and invisible, and the other being visual and public. It is difficult to decouple the apparent meaning of the GSR sensor from the light-emitting textile, so it cannot be said whether or not participants liked the aesthetic of this or not. Only one study pair articulated that they would like clothing that glowed or flashed. The issue of textiles in clothing emitting light or colour for all to see did not trouble participants; only one participant stated that she would not like to show her emotions on her clothing, but there was a shared understanding amongst everyone that such concern can be offset through personalisation.

During discussions with most study pairs, comparisons were made between text messaging and this type of touch communication. It was largely thought that this product should “*embody a wealth of combinations, almost like words*”; to engender multiplicity and universality to allow for personalisation. Touch communication is “*a more primitive way of communicating*”, whereas words are more “*sophisticated*”. Hand-written letters can embody rich qualities, in terms of smell, and the handwriting, which might alter as the letter progresses. In terms of this clothing concept, if technology permitted, it would be interesting to introduce actuation that could change in frequency to convey a sense of intensity in a tactile message. There is an important issue of keeping “*spontaneity alive*”, as one participant commented, “*otherwise it becomes another emoticon*”. Therefore, using this type of communication in certain contexts would be key, otherwise the ‘hug’ would become just a textile warming-up, as users become “*de-sensitised*”. Participants suggested that they would like to move the actuation around the garment, depending upon what they are doing, or upon their knowledge of the recipient, e.g., targeting sensitive parts of the body. One participant suggested that tactile communication could augment text messaging, where key words trigger certain types of actuation, thereby building up a repertoire of possible complements over time and through on-going conversations; this way meanings of such complements would be personally encoded. Conversely, about a third of the study pairs suggested that if sensations received were not what the user expected, you would “*re-programme yourself to make associations with the different types of actuation*”, thereby fostering a common understanding of their meanings.

To summarise, participants generally liked the idea of being able to communicate feelings, particularly through GSR. Many of them suggested that this type of communication seemed like a natural progression. The heatable textiles were understood and seemed to correlate with about half of the participants’ perceptions of touch. As in the first study, the tactile sensation of pressure corresponded with people’s associations of touch. But we have gained some insights into the potential use of the sensory qualities of textiles in representing intimate communication. What we can conclude is that communication is personal, but just like writing, there is a need for a universal language of sensations that people can configure to make multiple meanings. It can’t be underestimated that we are at the beginning of exploration in designing for smart clothing. As textile technology progresses, more options become available with which to fashion new types of sensations and aesthetics. But right now the actuator technology is still in its infancy, which means we, as designers, have to be creative in order to engineer sensations.

Design recommendation for the third iteration

When asked about their associations of touch, participants responded with terms such as pressure, pressure with presence, squeezing for a reassuring feeling, a tickling feeling. One participant suggested that touch should arouse in some way, to generate goose bumps. For the third and final iteration of this research project in order to generate some of these sensations we will design and engineer a shape-shifting actuator in the upper back of the garment to represent a hugging action. The shape-shifting actuator will contract against the skin, which will also pull in the jacket around the upper back of the wearer.

Conclusion and future work

In this article we have reviewed some of the related research around affective communication and wearable technology. There are many different approaches within this space, which perhaps suggests that it is an emerging area of interest. We have employed three different tests in this exploratory study, the findings from which should be taken as a start to try to gain insights and understandings around this kind of communication using consumer fashion wearable technology, as part of an on-going iterative and participatory design process in the *Communication-Wear* programme, of which this article represents the second part. We adopted an experimental design approach in that we're using prototypes as research *probes*, and using the language of our material culture, namely fashion and textiles, as the focus for this research. We were conscious that if this concept is to support their daily lives, then it must look like it would. We have generated data that suggests how people might use this kind of touch communication to support or complement their current communication practices. We have also started to explore people's sensory associations of touch, and to relate those to textile attributes in order to gain inspiration for new designs for the actuation of touch communication. We used a relatively small test sample, because we wanted to carry out an in-depth exploration, rather than general perceptions from a larger body. We have proposed three new design concepts for the next iteration that includes broadening the range of sensory capability to include different representations of touch. The analysed findings from this study have been used to design and produce a third iteration, which is now being tested in a field-based study, during which we will explore the social aspects of this communication.

It is very difficult to forecast what will be the take-up of new products, or how people will respond to them and integrate them into their lives. We think that such foresight is especially difficult to obtain when it comes to putting technology on the body. We, therefore, believe that gaining new understandings about people's behaviour and what they are capable of doing is very valuable for generating new design concepts for consumer fashion wearable technology.

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Assisting Collective Practices in a Healthcare Network, or Designing a Catalyst for a Community Of Action

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Abstract

This paper deals with guidelines for designing a computer-based system to support a healthcare network. A specific healthcare network, the RPM (“Réseau Pôle Mémoire” in French), is presented and its activities described. Based on the results of a one-year study, we suggest that the socio-cognitive relations between the members of this community play a useful role in addition to the information-sharing aspects. Some questions are discussed about how a system will be of use to this healthcare network, which is still in the process of being set up. To analyse this community, concepts such as coordination mechanisms boundary or intermediary objects and communities of action are used. Lastly, some guidelines are suggested and illustrated.

Introduction

For the last two years, we have been working with the RPM (“Réseau Pôle Mémoire” in French) healthcare network, which was set up to provide people suffering from memory deficits with complete medico-psycho-social care. The RPM network is a “Community of Action” (CoA), a term coined to name groups who “*actively and thus to some extent rationally pursue explicit goals while relying on a tightly woven fabric of relationships to promote mutual sympathy and the mimetic learning that is assumed to characterize primary groups and communities of practice.*” (Zacklad 2003). In fact, this community is still in the process of being set up.

The RPM network originated from some findings made by health professionals: first they complained about the very slow diagnosis of memory disorders such as Alzheimer’s disease, in particular. Since some treatments can efficiently prevent the fast evolution of this condition if they are administrated early enough, professionals must be able to detect the first signs of the disease as quickly as possible. Secondly, many people are now required to care for patients with memory disorders in the later stages of the disease, who used to be entirely dependent on their families and their friends. Nowadays, paramedical and social workers are being brought in, but these professionals are used to working alone and are not accustomed to linking up with professionals specialising in other fields. A group of neurologists and general practitioners therefore decided to set up a healthcare network to reduce the time required to make a proper diagnosis and to form a team focusing on patients with memory disorders. They first drew up a standard protocol for diagnosing patients properly and quickly and thought about ways of working together.

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In the present study, it is proposed to examine the role of a computer-based system in a community of this kind: how it might help the community to function, and whether it could serve as a catalyst. We will then look at what the specifications might be for designing a system of this kind.

In this article, we start by describing the members of the RPM network and their activities which we observed during one-year. We then use the Articulation Work Theory (Schmidt & Simone, 1996) to distinguish different phases of work in the RPM, and to define for which phase a computer-based system could be more important. We make then the hypothesis that this computer-based system could be a catalyst for the RPM community. We look at related work in Communities and Technologies and suggest guidelines for designing a computer-based system mediating the cooperation between the members of the healthcare network. These guidelines are illustrated by a scenario providing an example of how the tool with which we are providing the RPM network is intended to work. Finally, the role of this system in the network is discussed.

1. RPM: the healthcare network

1.1. Composition of the RPM network and the method used to observe its activities

The RPM network is a non-for-profit association composed of 190 members consisting mainly of private health professionals, hospital workers and other actors in the medical and social fields. The aim of this association is to promote and carry out all appropriate activities such as prevention, care, services, training and research to improve the situation of elderly people with cognitive disorders inhabiting Troyes and the surrounding area. The specialties of the 190 health professionals belonging to this network break down as follows: 4 Neurologists, 3 Psychiatrists, 12 Gerontologists, 98 General practitioners, 20 Speech therapists, 13 Psychologists, 2 Nurses, 1 Auxiliary, 10 Institutional representatives, 4 Users' representatives, 23 Others (representatives of social centers, a mutual insurance company, and a local information and coordination center). One of the main players in the network is the coordinator, who is responsible for supervising the patients' follow-up. The present coordinator is a neuropsychologist who acts in a professional capacity as well as playing the role of coordinator.

The present study was carried out for one year, using a participant observation method (Kawulich 2005). In addition to observing the participants, we actually contributed considerably to setting up the network by being present at the actors' side when they needed assistance, especially at computer level. We also participated actively in the IT commission by proposing a method enabling the participants to specify their needs exactly. Although we joined the network simply as observers, we were therefore also involved in designing the Information System required to assist the members' cooperative work. However, this was rather a difficult position, because we are not the usual actors: only health professionals or social professionals normally take part in the activities of the network.

1.2. Activities of the RPM network

The aims of the network, as well as the way it works, are defined by its members at meetings of various kinds:

- The practical commission, which includes fourteen people, meets once a month. This commission is currently attempting to define good practices so that professionals can refer to the documents giving these standards and act accordingly. These practices are liable to evolve with time and experience.
- The assessment commission, which consists of four people responsible for defining

quantitative and qualitative assessment criteria as well as procedures for collecting the information needed for making assessments. This commission has not yet met.

- The IT commission, which consists of six people, meets once a month. This commission is responsible for drafting the functional specifications of the Information System. The requirements are determined based on the diagnostic stage (i.e., stage one) in the patient route.

As far as collective care is concerned, staff meetings attended by fifteen people or so on average are held regularly. These meetings give participants an opportunity of discussing any difficult cases which arise. Depending on their specialties, the other participants will ask questions and suggest solutions or give advice about the most appropriate overall care strategies. The composition of the staff can change at each meeting.

Members of the commissions attend staff meetings in just the same way as other members. Whatever the agenda of these meetings may consist of, the aims of the network, its role and its limitations are also often discussed.

Members of the RPM network also meet at vocational training sessions. The content of these training sessions is decided at meetings of the practical commission. For example, twenty-seven participants are now taking part in a scheme for training speech therapists and psychologists to use neuropsychological assessment methods. Three training sessions for general practitioners have also taken place, each of which was attended by ten general practitioners on average. During these training sessions, participants learn how to perform three simple test making it possible to rule out some diagnoses, depending on the signs observed, and to confirm some suspicions or intuitions. A general practitioner trained in this way will be able to decide whether his patient should undergo further investigations.

1.3. Collective activities analysis

In order to understand exactly how the RPM functions, we attended all the meetings (those of the practical commission and the IT commission and staff meetings) held during a period of one year, and watched and filmed what occurred during these meetings. Ten meetings lasting approximately one and a half hours each were filmed and are now being retranscribed. In addition, retranscriptions of ten meetings which took place during previous years before the RPM association was officially set up were included in the corpus.

This corpus was processed using the NVivo² software tool, which makes it possible to manage a set of independent documents in the context of the same project. It gives overall results on the whole project, aggregating the analyses carried out on all or some of the documents involved in the project. In order to understand the nature of the oral exchanges between the members of the network, we coded the corpus using the theoretical framework adopted for this study, namely the modes of regulation defined in Symbolic Communicational Transactions Theory (Zacklad 2005). This theoretical framework includes four modes of regulating transactions between actors inside Communities of Action:

- the socio-relational mode of regulation deals with understanding others and their needs;
- the politico-organizational mode concerns the way people share out work;
- the epistemic mode of regulation relates to defining and planning collective patient healthcare management in the case of healthcare network settings,
- the instrumental mode of regulation has to do with the pooling of patients' data.

² NVivo (2002). QSR's software. <http://www.qsrinternational.com>, July © 2002 QSR International

To be able to understand and analyse the cooperative activities carried out by the RPM network, it was proposed to identify the various modes of regulation involved, to note which modes occurred most frequently, and to note any switching which occurred between these modes. A complete description of the method used for this purpose and the results obtained is to be found in (Bénard et al 2006). Here we present the initial results obtained, focusing on the modes of regulation identified.

Thirteen staff meetings and meetings of the practical commission have been retranscribed so far, forming a written corpus which was analysed as follows (it is worth noting that these various modes of regulation could be observed at the same meeting):

- 37 % of the speech turns corresponded to the instrumental mode of regulation, i.e., they were devoted to working out patients' global coverage.
- 31 % of the speech turns corresponded to the politico-organizational mode of regulation, i.e., defining organizational practices.
- 18 % of the speech turns corresponded to the socio-relational mode of regulation (reaffirming the network objectives, creating a collective identity).
- 14 % of the speech turns corresponded to the epistemic mode of regulation (defining care within RPM).

These initial results support the idea that even **transactions** which are **not directly related to problem-solving play a relevant role** in the life of the RPM network, since 32% of the exchanges corresponded to the socio-relational and the epistemic modes. They should therefore not be neglected when designing a tool promoting cooperation within the RPM network. It means that improvisation and informal discussions are necessary and that they contribute to the efficient functioning of the RPM network, as well as to the achievement of cooperative goals. In addition, network members have to be able to switch quickly and easily from one mode of regulation to another. These healthcare professionals have to be increasingly flexible, in fact because of the fast development of the community which is being set up and the changes it is undergoing.

2. Understanding the articulation work in the RPM

As explained in the Introduction, one of the reasons for setting up this network was the need to shorten the time required to make a diagnosis. There are several reasons why the diagnostic process often tends to be too lengthy: first of all, since general practitioners are not properly trained to deal with conditions of this kind, they only begin to suspect their presence when the signs are highly visible and the disease has reached a fairly advanced stage. The second reason is that the specialists who are qualified to make an exact diagnosis have long waiting lists. However, many of the people filling up the waiting lists do not really need to be there and could be filtered out by their general practitioners if the latter were more knowledgeable about these diseases.

In view of this situation, the founders of the network decided to design a patient route consisting of the following five steps:

1. The detection step serving as an initial filter by sorting out patients who require a detailed assessment from those who do not.
2. Patients who need a more detailed assessment can then choose which of the neuropsychologists in the network will carry out this test.
3. Depending on the test results, the patient will then choose one of the other specialists, who can be a neurologist, a gerontologist or a psychiatrist.
4. The specialist chosen then diagnoses the pathology exactly and prescribes an appropriate treatment. The patient's regular doctor, who will continue to follow the

patient, will be free to adapt this treatment as required. This is the end of the first stage of the diagnostic stage.

5. At the end of these steps, the patient is treated by a team of health professionals. For instance, if a psychopathological disorder has been diagnosed, the team will be composed of the patient's regular general practitioner, a social worker or a coordinator of a CLIC ("Centre Local d'Information et de Coordination" in French, which means the Local Information and Coordination Center), the RPM network coordinator, and possibly a psychiatrist or a psychologist. If a neurodegenerative disease has been diagnosed, the team will be composed of the patient's general practitioner, a specialist, a speech therapist, a psychologist, a social worker, a gerontological psychologist, the RPM coordinator, and possibly other network partners. If the diagnosis is an intermediate one, the team will consist of the patient's general practitioner, a specialist, a neuropsychologist, the RPM coordinator, and possibly a psychiatrist. In the case of an undefined condition, the patient's situation is discussed at a staff meeting.

The standard diagnostic stage adopted by the network has reduced the time elapsing between the patients' first contact with a member of the network and the start of their treatment by four months. In order to act fast during the first few steps in the protocol, neuropsychologists and specialists keep special slots open in their schedules. Patients referred by the network can therefore obtain appointments much more quickly than usual. Thanks to the five-step procedure described above, professionals in the network are consulted only by people with real needs.

If we sum up, in the RPM network, the Patient Route is composed of two stages:

The **first** stage is the diagnostic stage which could also be termed a script (Suchman 1987). This first stage is assisted by tools such as telephones and personal diaries: each patient has to take an appointment with the professional he has chosen. The diagnosis therefore involves deciding which type of professional will intervene at each step in the first part of the protocol. This **first stage on the patient route involves applying a procedure, using several personal artefacts**. Since the procedure has been clearly defined, no common artefact is necessary. We could possibly draw up a workflow chart at this stage, but professionals have not expressed any need for technical aids of this kind for the moment.

The **second** stage centres on the collective care. Once a diagnosis has been made, a specific pool of professionals takes care of the patient; the types of professionals who will intervene are chosen by the patients themselves. This collective care is supported by discussions necessary so that collective decisions can be made. It seems to be necessary for these discussions to take place without the constraints of official pressure. These discussions therefore do not have to be recorded in the patients' files. At this stage, we have a weak coordinative protocol based on common social conventions. In this second stage, **there is no formal coordinative protocol** (Schmidt, Simone, 1996), **and no artefact**. The only means to care the patients collectively are the meetings. Besides, professionals' discussions often focus on their common identity and what they should do as members of this particular healthcare network.

Our hypothesis is that, when there is no formal coordinative protocol, an **artefact is all the more badly needed. In addition to making real collective care possible, it could crystallize the network**. It could serve to show professionals how to organize collective work focusing on each patient and actually help to shape the RPM network. It could allow improvisation when face-to-face communication is not possible. We therefore suggest that

cooperation cannot be summed up as the interdependency between individual tasks and their articulation, since “improvisation”, i.e., part of the work which it is impossible to structure and to define in a coordinative protocol, also plays a role.

3. Designing a catalyst for RPM

3.1. RPM characteristics

1. RPM obtained financial resources three years ago. These resources were dedicated to the building of the medico-psycho-social structure supporting the members of the networks in their collective activities. But these members are not paid for their participation. Moreover, they participate in the network in addition to their own practice. These factors, added to the fact that they are geographically dispersed, lead to a situation where the members of the network cannot spend a lot of time to meet the others.
2. Defining collective care in a network implies several changes in usual medical practices:
 - First, general practitioners become the mainspring of the team which takes care of a patient (which we called the pool).
 - Professionals can share the information about patients (instead of having a different patient file for each professional).
 - Patients, and/or her/his close circle, take an active part in the care. Professionals involve them in the care in order to provide the best quality of care.
 - Professionals have to coordinate with each others (instead of having an individual activity as usual).
 - Each professional, whatever his role facing the patient (general practitioner or specialist, nurse, social worker, etc.) has to be free to express her/his point of view about the care of a patient. This is a major point in healthcare networks which is really difficult to achieve because of the importance of hierarchical barriers in the medical domain. The patient, have to be able to speak in an equal way facing other professionals.

3.1. Related work

Our initial findings follow actual researches at the junction of Communities and Information and Communication Technologies. Indeed, they focus more on assisting knowledge sharing, learning, and mediation of social relations, than on data sharing or business processes automating. For instance, about knowledge sharing, we can quote Ruuska and Vartiainen (2003) who discuss sharing knowledge among projects in a multi-projects environment. Our issues are close to theirs, since network members need to share knowledge collected thanks to their experiences with patients. Regarding learning, Josefsson (2003) studied how a tool mediating the interactions between health providers and patients has been diverted from its initial aim; patients became themselves producers of information and discussed via the tool without any intermediary. The Drehscheibe Project (Koch 2003) allows e-learning without focusing on knowledge management, and provides a generic communication and matchmaking medium. Concerning the mediation of social relations, Hooff et al (2003) suggest that connectivity, trust and identity play a relevant role in knowledge sharing. The issue of supporting interactions has also been discussed by Hardstone et al (2004). These authors mention that many informal discussions take place between health professionals, and that they constitute necessary steps towards caring for patients and organizing the caring process. Our results support this idea, and we will now suggest a way of mediating part of

these transactions via a computer-based system.

3.2. Functional Requirements

As said in the introduction, three activities will have to be facilitated by a system:

1. Coordination of actors during the diagnosis stage
2. Global care of diagnosed patients
3. Reflexive work aiming at defining good practices, training and assessment criteria.

As these activities are in the heart of practices of RPM, they have to be enhanced by the system, and so they have to be considered in the design.

Engaged professionals are, for the most, self – taught as for informatics. Moreover, they are volunteer professionals; it means that they participate to the actions of RPM, in addition to their own practice. By consequence, they have no time to devote for training to a new system. So, the system must be easy to use and must be the most intuitive to be used and useful. This is an additional constraint to the design of our system. Finally, a financial constraint is added since the network does not have any budget to pay for a system.

Coordination of actors during the diagnosis stage

This coordination follows a process which allows each of actors to know what others do and act accordingly. This process is an organisational tool for RPM. Moreover, for practical reasons, functionalities like shared calendar, book of RPM professionals' addresses and phone numbers, electronic mail service would favour coordination of actors.

Consequently, following to the different reasons we presented above, we choose to use Gmail³. This web tool is free and efficient. The electronic mail service is not secured but people who need a secured one have one yet. This mail service aims at help people to coordinate and do not aim at assisting negotiation about patient.

Global care of diagnosed patients

The collective care does not follow any process. Furthermore, the lack of availability of professionals and their geographical dispersion are brakes to the realisation of this collective activity. Also, a system could favour the accomplishment of this activity. Information sharing about the patient is necessary to the global care. As we demonstrated above, this information sharing is not sufficient to allow cooperation of professionals. Discussion and negotiation are necessary too and should have been allowed by the system.

Moreover, some researches in Computer Mediated Communication relying to the “equalization phenomenon” showed that the use of electronic medias lessens hierarchical barriers (Marcocchia, 2005). For instance, Dubrovsky et al (1991) compared face-to-face discussions with mediated ones within groups where hierarchical barriers could prevent people to express themselves during meetings. They found that groups who discussed through media tend to be more equal in the participation to the discussion. Indeed, people with a lower degree in the hierarchy tend to speak more and their opinions were more considered than in face-to-face situations.

Actually, the fact that anybody can speak equally whatever the role facing patients is one of

³ Gmail : ©2007 Google

the goals of RPM since this enhances the collective care. Indeed, hierarchical barriers are strong between health professionals. Often, nurses hesitate to speak with doctors. This feeling of inferiority is reinforced when their opinions are not taken into account. RPM has to minimize these fears and hesitations to function better. Researches concerning Computer Mediated Communication show that the use of media to communicate could help RPM. A computer-based system seems to be a good solution to assist discussions about patients in order to suppress one of the brakes to the cooperation of RPM.

A chat tool could be set up to mediate discussions between professionals who care a same patient, these discussions being linked to the patients' files, but not integrated into it. This intuitive and easy functionality do not need any training period and will be usable as the system will be installed. It still remains to be decided whether we will store these interactions for future reference or whether we will erase them after each discussion. Indeed, everything that is written down can pose problems for the following reasons:

- In France, patients will soon be allowed to have access to their files. Professionals must therefore be careful about what they write in their files and what turns of phrase they use, otherwise patients might find information that they cannot interpret properly or that they find hurtful.
- The second reason has to do with the legal protection of the professionals. They do not want patients to take them to court for making an error, as sometimes happens. It would probably be worth anonymizing this information and storing it so as to be able to make further use of these discussions.

Reflexive work

Concerning the reflexive work that we observed during the meetings of the practical commission, professionals need, to be more efficient, some functionalities like electronic library and collective writing. They could keep their thoughts going with some reference documents and write collectively some documents which will become references for RPM. This reflexive work is assisted by Gmail, which allows documents' management.

Lastly, the future computer-based system designed for RPM will have to be flexible enough to allow professionals to redefine their protocols and to assist them in this activity. In addition, it will have to allow professionals to shift easily from one activity to another, as they do in their everyday practice (cf section 3).

3.3. Technical requirements

As the members of the RPM network are not really familiar with a professional use of computer-based systems, we decided, when it was possible, to offer them an environment that they could have met before. In other words, we tried to reuse as much as possible standard web-based functions. Following the same idea, the secure access has to be based on the health professional card (provided by Social Security) that the professionals use already.

The shared patient file is the heart of the system, linked with different functionalities to answer the different needs of the professionals. To develop it, we used open sources technologies since RPM received, for the moment, no fundings for the informatics development. The patient's data are then stored in a MySQL database, on an Apache server and we used html, php and JavaScript programming languages. The shared patient file has to stipulate the different parts of the file to which the various professionals will access (for instance, social workers do not have access to the medical part of the file). It has also to mediate the cooperative work by providing information about what the other professional participants are doing on other lines: the neurologist will be able to find out what the social

worker has been doing, for example. They will also be able to share knowledge about the patient: health professionals will be able to explain how a disease is liable to affect a patient's behaviour, or psychologists will be able to inform their colleagues about a patient's emotional state. Social workers will be able to inform other professionals about the social assistance to which a patient is entitled.

Two additional modules will be available, the first one providing electronic mail, calendar and contacts management, and the second one allowing documents sharing and collective editing. These two modules, once opened, could be placed everywhere in the screen and be removed whenever, and their size could be shaped too. The system remains easy to use and malleable since the users can interrupt an activity (document editing, e-mail writing ...) to make another one in parallel.

3.4. Use Cases and Illustration

Once any of the members of the RPM network is logged on, s/he can access the files of the patients he/she takes care, each patient appearing like a tab on the top of the screen. When s/he clicks on the name of a patient, a shared patient file, made of four parts, opens. Each part is dedicated to a different kind of information: administrative, medical, social and psychological. Each piece of information is alterable. Furthermore, each general practitioner can add a patient. Users have limited access to the various parts, depending on their profession. A private chat is linked to each patient's file, in order to allow only the professionals in the group allotted to that patient to discuss this case. All the usual functions such as smileys or searching the archives which normally go with chat are available and can be used here.

We are now going to describe a situation where professionals cooperate around a patient, illustrated in figure 1:

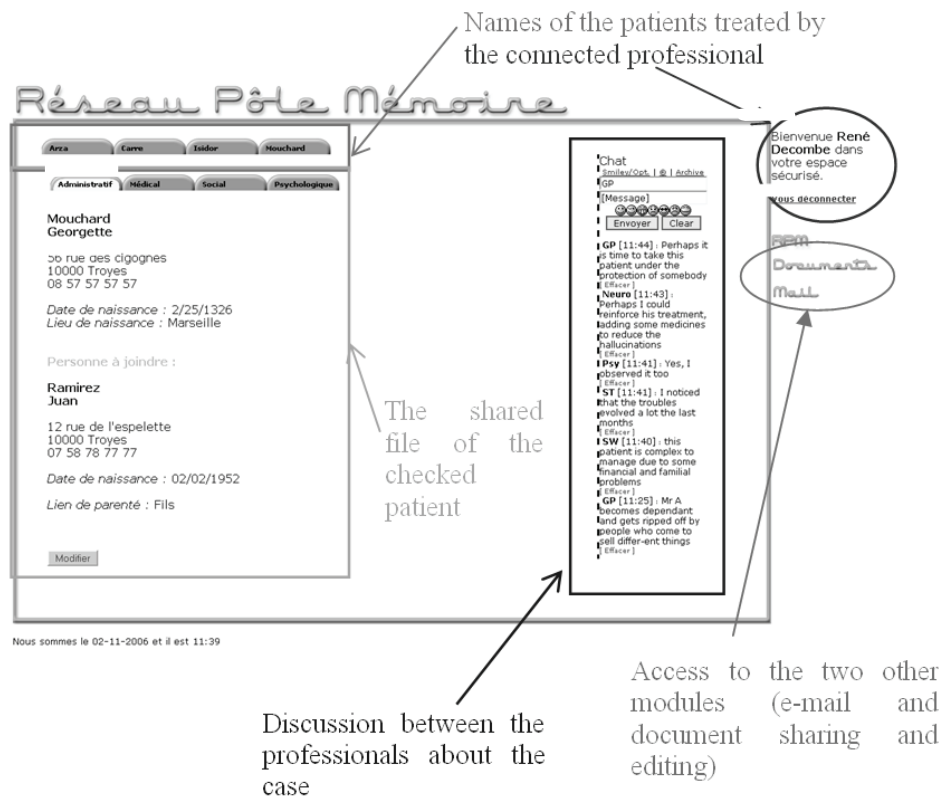
1. After a consultation with a patient we have called Mr A, the general practitioner opens the shared patient's file and initiates a discussion with the professionals who care for this patient. On the chat linked to the patients' files, the general practitioner explains the problem noted during the consultation with Mr A (for example, Mr A is becoming dependent and it being taken advantage of by door-to-door vendors). The social worker explains that this patient is difficult to manage because of the financial and familial problems involved. The general practitioner, the neurologist, the psychologist and the speech therapist discuss the patient's treatment, and whether it should be changed in view of the evolution of his symptoms during the last few months. Finally, they suggest putting a caregiver in charge of this patient. The social worker proposes to discuss this solution with the patient. It remains to be decided who the caregiver in charge could be.
2. After discussing the case with other professionals, the general practitioner consults the documents defining good practices, which explain how to make the RPM network initiate the procedure for placing a patient in somebody's charge. To do so, the user then opens the "documents" window and retrieves the appropriate text⁴. This document can be called up and read directly on the screen.
3. The general practitioner then sends an e-mail to the RPM network's coordination team, asking them to prepare a request to entrust Mr A to a caregiver and to make the RPM network the official appellant for this purpose. To do so, the general

⁴ ©2006 Google (Docs and Spreadsheets)

practitioner opens the e-mail window⁵, and looks for the e-mail address required in the section headed “contacts”, before sending the e-mail.

4. After a positive answer from the RPM network’s coordination team, the general practitioner checks the work schedule and suggests presenting this case at the next staff meeting, in order to discuss this issue with other network members. The general practitioner sends an e-mail to the group of professionals allocated to this patient and to the RPM network’s coordination team.

Figure 1. Environment offered to the members of the RPM network



4. Discussion about the role of the tool

To analyse the role of the system in the RPM community, we suggest to look at the shared patient file as a boundary object (Star, 1989), making different medical and social professionals interact. At the same time, this file could provide a common reference frame for their discussions, and could serve the different interest of each professional; neurologists could see it as the means of providing statistical data (epidemiology), social workers appreciate the possibility it gives of anticipating patients’ needs depending on the treatment they are undergoing, and psychologists are glad to be able to use this tool to propose a change of treatment.

The shared patient file could also be seen as an intermediary objects. When speaking about intermediary objects, Vinck (1999) has said that they “can be said to form a whole set of

⁵ ©2006 Google (Gmail)

media, vehicles and instruments materializing the interactions between players”⁶. Discussions about patients focusing on their files could make the files evolve, and thus make the situation of the patients evolve. The shared patient file could then carry the story of the patient and the decisions of the professionals involved in caring for the patient. Speaking again of intermediary objects, Vinck (1999) has said: “It is shaped by the players as well as being fetishized, i.e., treated as something extending beyond the social context in which it has just been created”⁷. The good practices defined by the practical commission can therefore also be said to be intermediary objects.

In conclusion, the computer-based system seems to play a role in shaping the community, giving it a concrete form by enhancing its social structure. These analyses supplement our previous results on the relevance of providing functions to assist conversations linked to the shared patients’ files.

5. Conclusion

In this article, we question the role of an artefact in a community of action, and so doing what design guidelines it could imply. We make the hypothesis, that, when there is no protocol apart from social conventions, an artefact is all the more badly needed. In other words, we are interested in the artefact, not only for its capacity to assist a work process, but moreover for its ability, as a catalyst, to shape a community. In the RPM network, one of the aims is the collective care of patients. Shared patients’ files are so necessary but not sufficient. Indeed, we observed numerous face-to-face situations where, at the same time, the members discussed about their patients and about the identity of the network, (re)defining its aim, the roles of each other, the protocols... As these face-to-face situations are not always possible, conversations have to be part-of a computer-based system for this community of action. Besides, the continual switches between all the possible actions of an actor (sharing patients’ data, writing good practices, discussing, and coordinating the collective care ...) make the malleability an important feature of this system. Finally, the architecture of the computer-based system is modular, reusing - when possible - existing standard web-based tools.

The next steps (already scheduled) will consist first in confronting the prototype presented in section 3 to a small group of users (1 general practitioner, 1 neurologist, 1 psychologist – the coordinator, 2 social workers, 1 neuro-psychiatrist). After the implementation of possible evolutions which will be requested by these users, we will offer the computer-based system to the whole network. We will then be able to observe how the members of the community of action use the system, if it has any influence on the collective care and on the articulation work done actually during the meetings.

⁶ Translated from the French “Ceux-ci sont apparus comme autant de supports, de vecteurs, de matérialisations ou de médiatisations des interactions entre acteurs.”

⁷ Translated from the French “Il est façonné par les acteurs en même temps que “fétichisé”, c’est à dire saisi comme dépassant le social qui vient de le construire.”

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Social Sciences Information User Behavior and Searching Strategies in Multifarious Environment

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Abstract

This paper presents a multidimensional approach to the analyses of information users in the field of social sciences, with special attention to their needs and searching behavior for further incorporation in ICTs policy and user involvement. We report on a study concerned with understanding user's adaptation to new information searching environments formed by modern technology in general and on user behavior and search strategies in particular. The search strategies oriented on different categories of users are described. A number of observations of user searching behavior on the Web and various social science databases are offered for discussion.

1. Over the last decade the interaction between society and ICTs is becoming an active area of social science enquiry. The wide implementation of new information technologies has resulted in a growing number of users as well as in the changes of their information needs and behavior. There is a lot of factors affecting the efficient use of ICT connected with the changes in the social science methodology. Modern society has faced many complex problems caused by the rapid rate of technological progress. These problems concern the wider implementation of information technologies of gathering, extraction and analysis of information from the Internet and other sources as well as the improvement of quality of information supply. Digital resources have grown at an astonishing rate during last decade, but social science information users do not yet have the technology to make the fullest use of these resources because generally these resources are not connected to each other and users do not use effective search strategies.

Another factor concerns the pertinent analysis of decision-making process in different spheres. In terms of social science decision-making ICT has a non-negligible impact on changing the society in terms of behavioral and mental patterns. Consequently, new information technology also enhances the adjustment of individuals' adaptability to a higher dynamics of changes in the society. Now when the information load is increasing at a great speed one can feel more sharply the limitation of such a valuable resource as time. However there is a huge desire to find the most relevant resources and to choose an optimal variant for each user. It means that it is necessary to construct the optimal model of information behavior and the most effective search strategy for each situation providing an effective utilization of the information technologies capable to help end-users to solve conceptual or practical problems.

It happens that the sharp growth of new opportunities sometimes gives rise to a user's sensation of chaos, stress or at least confusion when faced with the ready accessibility of a huge variety of information resources. To draw an electronic portrait of social science information users as human actors it is important to define what type of electronic information they deal with and how they collect, store, use, disseminate information as well as generate

new knowledge. We report on a study concerned with understanding user's adaptation to new information searching environments formed by modern technology in general and on user behavior and search strategies in particular. The goals of our research are:

- To advance our understanding of retrieval and use of social science information for research, decision-making and teaching;
- To provide a case study focusing on search strategies relevant for different user groups;
- To support the further development of the social science information system by improving the user interface design (both in Russian and English) and by developing linguistic tools that make social science information more accessible;
- To evaluate the ICT impact on user behavior and search modes in multifarious environment of social science databases, to explore the strength and weakness of current and emerging technologies as well as to look at the full range of tools that information professionals and customers.

Our fundamental premise is to show that the design of social science information system and its databases should be user-centered, iterative and adaptive.

We've done a lot of extensive interviews with science information users about information needs, search goals and strategies as well as their satisfaction with retrieval results. We've used a variety of methods including user queries analysis, search protocols evaluation, user feedback and user testing of different search modes and linguistic tools. This paper is based on the initial findings of our empirical study examining the user behavior and search strategies in various social science databases. It is a part of the long-term research project the INION Center for Informatisation has been conducted for several years. Data gathered via the questionnaires was analyzed using SPSS (Statistical Package for the Social Sciences) and WinIRBIS Statistical Software.

We have studied how users with various degrees of familiarity with information systems, databases and varying models of the retrieval behavior interacted in multifarious environment of one of the largest information system in Russia (www.inion.ru). What is the system's multifarious environment? Each social science database is intended to be searched by a set of potential users or customers. Information on specific topics or multidimensional information on global problems can be available searching all or several databases combined in united one. And there is another way: to download information from different sources and to create a problem-oriented database.

2. The main purpose of our system is to provide users with information on different problems of social sciences and first of all on national and global problems such as terrorism, energy supply, international migration, drug and slave trades and some others which cannot be solved immediately. These problems are complex, intractable and interrelated and often put stress on the decision-making processes and institutional capacities beyond their limits. Social science problems are very complicated, often poorly described and sometimes recognized only after a long period of time or crucial changes occur. The decision-makers, as a rule, rely on experts and information professionals as well as researchers, analysts, strategists in order to create a global consensus on how in the best way to respond to these problems. Thus, although anyone can be a user of social science information there are some primary groups (or categories):

- social science scientists and researchers;
- high school teachers, lecturers and professors;
- postgraduates and young specialists, essentially novices with lack of subject-matter expertise;

- professional persons with considerable subject matter knowledge, skilled at interpreting the information in their fields of interests (such as lawyers, bankers, accountants, businessmen, market consultants);
- senior managers, decision makers, leaders;
- journalists, news makers, reporters;
- information specialists as well as information brokers providing information service and assisting others in searching for data and information; they do not create information, but find it and deliver it to other customers.

The analysis of users characteristics might be of some interest: 1) the educational level – 12 % had a Bachelor's degree, 35 % had a Masters, 47 % had or expected to receive a Ph.D., and 6 % - academicians; 2) age distribution – 26 % were between 19 and 23 years, while 52 % between 24 and 33, only 8 % between 34 and 50, 12 % between 51 and 60, and 2 % were over 60 years old; 3) gender distribution – 63 % female, 37 % male.

According to the branches of activity the social science information users can be characterized as following: politology, state and law - 29,1%, economics and demography - 24,6%, philosophy and sociology - 17,5 %, history, ethnology, anthropology - 5,6%, linguistics - 5,3%, literary criticism - 4,8%, science of sciences - 3,2% and others, including polythematic queries – up to 10%.

The experienced searchers known as information intermediaries for years skillfully processed queries of large amount of social science information customers as academicians, top managers, politicians to retrieve information both manual and on-line. The advantages of information retrieval in the social sciences databases seem quite obvious to the majority of scholars: access to retrospective information has become faster, more flexible and comprehensive. It is necessary to note that social science researchers have traditionally searched for the information themselves: the information retrieval is the major component of their scientific activity. The new information technologies have substantially changed their information behavior and requirements.

We know discouragingly little what those skills are and how they are developing in new technology environment and it is difficult to define exactly what an experienced searcher should know about information searching that a beginner does not. The analysis of social science information users has revealed several groups with different level of searching skills. There is a considerable body of research on user behavior and searching strategies regarding information retrieval systems although researches on retrieval from the World Wide Web and social science databases in particularly are not as advanced, although surveys of Web usage give some sense of what the average Web searcher is doing.

Our research was focused on such main subjects as the user's work task, their information needs and requirements as well as their searching goals, tactics and strategies which could be named and discussed in such categories as query formulation, database definition, keywords and 'catch' terms selection.

3. The search strategy is one of the most important elements in information retrieval. To satisfy information needs of social scientists and to meet objectives of on-line retrieval, heuristic in nature, it is necessary to choose from the existing alternatives.

Social science information users have several sources of ideas and data to draw on. These information sources include their graduate studies, journal reading and note-taking, discussions with colleagues, listening to presentations at conferences, relevant databases (national and international) and their current research interests. These sources, however, are disparate in time and space and need to be consolidated into a single list of possible topics for exploration. After information searching the resulting stimulus list can be reviewed and up-

dated regularly with certain ideas being deleted and others being added or developed. This list can help to keep the user aware of potentially fruitful areas of query construction and of topics on which future articles or researches may be based.

At every stage of interaction with the information system the user is in this or that state of uncertainty that could be resolved by decision-making which implies a choice from a variety of options and depends greatly on the potential search strategies. There are three main patterns of information retrieval behavior each of which demand different search strategies: 1) on-line searching by end-users themselves; 2) retrieval by an information specialist in the absence of the requester; 3) search by the remote users in cooperation with an information specialist (so called a virtual team). In our opinion the last one could be the most effective with regard to the results, timesaving, costs and benefits. The information specialist's knowledge of search possibilities guarantees high recall, and by the user's verifying results, the search strategy can be immediately corrected to obtain the best results. The major focus should be made on the precision and flexibility of human thinking in query formulation and on the turn from the information technology to the languages that are running it.

Social science information retrieval quite often demands alternative decisions to expand or to narrow search limits, to transfer the query to another database depending on the results received. A lot of search tactics might be employed to build a bridge between the user's query and the information system. At present there are no fully reliable criteria for choosing the best strategies and tactics for each retrieval situation. However our experience of searching social sciences databases shows that the process of information retrieval is full of typical situations. It might be useful first of all to see if the searching, one plans to do, has already been undertaken by someone else. Many of the articles, books or reports covered in online databases are themselves extensive bibliographies or state-of-the art reviews. In order to elucidate the role of the strategy in human information searching it is necessary to define main types of retrieval models that could be used for the scientific purposes of describing, ultimately predicting and explaining the user behavior. Nevertheless, queries which have the same formulation or appear to be the same on the surface are often performed differently in terms of actual retrieval with the help of various information resources and search engines. To some extent the diversity of information included to this or that database allows users to reveal new areas of investigation and unfamiliar approaches. To some other users the greater efficiency of information selection and full literature review allows more time to be dedicated to the research itself. And this is very attractive to the users. Social science users undertaking a search in relevant information systems believe that they can interact with the information resources thus permitting on-the-spot decisions regarding the choice of adequate terminology and play around tentative ideas while also searching for a resolution to a problem.

The content analysis of 4,052 queries from more than 3,500 users processed during last three years allowed to define the routine searching strategies employed by social science users. At least three models of search strategy can be distinguished such as logical searching based on formal criteria of optimality, teaching models that make it easy for users to learn to search and facilitating ones that help users to search information more efficiently or effectively. As an example the social science logical searching models include: a) the menu-oriented strategy designed for novice users which is based on query formation by example; b) the logical construction of retrieval scheme for trained searchers using direct input of 'catch' words (descriptors and keywords) and search field names; c) the so called step-by-step query creation mode providing the most flexible information strategies for advanced users. The heuristic searching mode could be used as the perfect tool for users who fail to find sufficient relevant information. As far as teaching and facilitating models are concerned they are expected be developed in the nearest future. In order to design searching route through the information resources to reach the needed information a user can break complex search

queries down into sub-problems and work on one problem at a time. This is a well-established and productive technique in general problem solving which allows to grid information flows. As each sub-problem is solved, the parts can then be knit into a solution to the whole, larger problem. As rule such binary searching is a more efficient approach than serial or random searching and helps to spot 'hot topics' before they become mainstream. Yet a rigid adherence to this principle would probably be wasteful, since human beings have additional contextual knowledge about different information resources.

4. Term specificity in social sciences is one of the crucial problems that should be solved to make information retrieval optimal. Thus, it is a good idea to try to locate terms to search with that are on several levels of specify relative to the topic of interest. One can expand or alter a search formulation by using different strategies and moving upwards or downwards the hierarchy or to move sideways hierarchically to coordinate terms. The searcher can perform these strategies by looking through a thesaurus or other linguistic tools. Every searcher is familiar with the case where a widely used term mysteriously produces no records, or only a very small number – far fewer than could be reasonably expected for that term in a particular database. In order to search effectively it is important to be aware of the difference between a term and a concept, since the two are treated differently in search formulations. A concept especially in social sciences could be expressed by several synonymous or nearly relative terms, each of which, in turn, may contain several words. Combining search terms with Boolean logic is at the heart of online searching. Searches which require exact matches, like Boolean searches, may not retrieve any records. In this case the system should inform and help the user. Several search strategies can be used to manipulate the search formulation until it produces the sort of postings set desired. It is possible to exhaust the search formulation or include most (or all) of the concept of a search topic in the initial search formulation, or to add one or more of the query concepts to an already used search formulation, to block or to reject items indexed by certain terms. It is possible to make the search formulation more precise by reducing the number of parallel terms. The fewer variant terms one lists for each concept, the fewer documents there will likely be that match the request.

One of the main tasks at the early stages of on-line search is to identify 'good' terms to search with. We have managed to develop a number of social science thesauri that can be viewed as matching or translating tools. They are used online or built in the search engines. Vocabulary problems are central to the economics of digital resources processing because an unfamiliar vocabulary reduces search effectiveness. The little bit of effort spent reviewing possible search terms in the linguistic reference databases can eliminate search time. These databases can be used for word-by-word searching of descriptors, keywords and subject category codes. Several strategies can be used to generate additional terms to enrich search formulation, for example, by looking at neighboring terms in alphabetically arranged lists of different terms. It is important to remember that a given topic a) may be discussed in documents wholly devoted to that topic; or b) may appear as a subtopic in a document devoted to a broader topic; or c) may have just part of its content dealt with a document on a narrow topic. Documents of all of three types may be of interest to the requester, but documents of only the first type will be retrieved if the only search terms used are those are exactly descriptive of the topic, and not broader or narrower. Thus, it is a good idea to try to locate terms to search with that are on several levels of specify relative to the topic of interest.

It is possible to expand or alter a search formulation by using different strategies and moving upwards or downwards the hierarchy or to move sideways hierarchically to coordinate terms. The searcher can perform these strategies by looking through a built-in thesaurus or other linguistic tools (if any). Every searcher is familiar with the case where a widely used term

mysteriously produces no postings, or only a very small number – far fewer than could be reasonably expected for that term in that database. Usually this occurs because the database uses the spacing or spelling variant other than the one that occurred to the searcher to use.

Another strategy is to reduce the number of concepts of a search topic in the initial search formulation, or to subtract one or more of the query concepts from an already used search formulation. Next, any given conceptual element can be broadened by entering additional variant terms or through the use of truncation. It is important to stress that the social science databases are continually being expanded with user participation, notably through the addition of more specific terms that are aspects of those already included.

5. Observations of the average Web searcher point out that ineffective use may be caused by lack of understanding of how a search engine interprets a query. Thus it can be seen that there has been a shift towards the introduction of search features that appear to respond to the ways in which users actually search these systems, e.g. search assistance, query formulation, query modification and navigation. It can be assumed that most users do not use advanced search features, or enter complex queries, or want to interact with search systems. As a consequence, systems such as search engines are now trying to automate query formulation, shifting the burden of formulating precise or extensive terminology from the user to the system and to develop the multicultural complex of linguistic tools.

In general a comparison of the typical retrieval strategies of our searchers shows a strong similarity in routine user behavior. However, the ways in which they used, for example, relevance feedback and other new system features varied. These different patterns of information behavior suggest that it may be hard to predict, based upon descriptions of routine strategies alone, how searchers will behave in multifarious environment. Some factors appear to remain constant across searchers, no matter what their experience are, but others seem to change in what might be regular ways.

Finally, we have tried to specify characteristics of social science information users as eActors and predict just how they will adapt to the new information technology. We have tried to define some searching strategies which could be useful in understanding user behavior and improvement of the databases design as well as linguistic tools. And that is good, because it leaves lots more scope for further research.

During experimental researches various levels of user self-realization of information search have been found out: first, routine - the sanction of search problem is carried out by analogy to earlier mastered algorithms of activity. Users constantly address to the information intermediary for a detailed explanation of requirements of a research task, algorithm of search, aspire to reception of "fast results" with the least intellectual expenses. They do not aspire to mastering by various strategy of search. Second, adaptable – users spend search on the basis of one of available logical models. This level assumes the absence of steady user aspiration to personal-valuable self-determination and self-realization during searching. Third, reflective – users do not only try to define the essence of a research problem, aspire to simulate various situations and different ways of their sanction. Using a reflection, they critically analyze search results, using simple and complex strategies and trying to determine the barriers interfering search of the necessary information. And the last one – creative - allowing not only to use various strategies of information search, but also to generate the new knowledge on their basis, new approaches to the problem decision.

Traditionally the social science databases were intended to be used by scholars themselves. Nevertheless, it is important to stress that end-users, while often familiar with the literature in their field of interest, are not aware of the existing thesauri, access methods, structure and content of one-line databases and search aids that are well-known to information specialists.

They often have difficulty grasping Boolean logic, revising ineffective searches and interpreting computer responses. End-user tends to search infrequently and hence to forget even command sequences. Furthermore, they usually can not specify their information requirements in ways appropriate for search formulation. It is necessary to note that the majority of our respondents reported searching through the Internet sites once or twice a week using no logical operators, and the remainder (11%) reported daily use. Most of them are searching only for themselves and 21% for themselves and others (for patrons, professors, top managers). Not more than 15% employ the Internet in their everyday searching environments. In most cases end-user searches tend to take as much as 50% longer than those of trained intermediaries. Experienced on-line searchers, we hope, avoid all these problems through training and frequent practice. But still of all the factors involved in searching databases, the cost of the services are what users are most concerned about – not the recall or precision of their search.

6. We conducted a study in which social science information users responded to an interactive survey in which they were asked about their search topics (or research problems), intended query terms (as a rule very specific), search frequency in various databases. Search topics were spread across 10-12 subject categories in each social science database. Most respondents searched on a single topic as determined by their query terms. The mean number of terms in a query was rather high at 8.5. The most frequently searched Web sites that provide data and information of interest to the social science users include the INION databases, the EBSCO databases with thousands of e-journals containing millions of articles, the Social Sciences Virtual Library, Social Sciences Full Text (the most important English-language journals published in the U.S. and elsewhere with full text and page images), the EINIRAS Database Network (a virtual Pan-European system of databases for international relations and area studies), the DARE database at UNESCO Social and Human Sciences Documentation Centre that provides access to world wide information on social science, peace and human rights, the SOLIS database with information on approximately 370 social science periodicals, the PROEastE database (Social Science Research PROjects in Eastern Europe), the ASSR database of the Arab Institute for Studies and Communication (in English and Arabic) as well as the Informaworld electronic resources of Taylor & Francis, Routledge, Psychology Press and Informa Healthcare in one searchable interface and a lot of others. It's worth to note that Social Science Information Gateway (UK Intute: Social Sciences) combining the resources of two services - Altis and SOSIG - offers an easy to use and powerful tool for discovering the best Internet resources in wide range of subjects, including social sciences, arts and humanities. It provides free Internet tutorials to help users learn how to get the best from the Web for their education and research.

We put forward a number of observations from our experience of user searching behavior on the Web and various social science databases. These findings can be summarized as: 1) social science information users search the Web using 2-3 searching engines and as a rule not more than two databases; 2) they spend not more than half an hour searching for the information in Russian language and less than one hour searching information in foreign languages (first of all English, German, French and Spanish); 3) searching skills vary and users often assess themselves as being more skilled than they actually are (particularly searching foreign databases); most participants considered their levels of satisfaction with the search results to be 'good', having no clear idea of how search engines use the queries to search for information; 4) they random use linguistic tools such as thesaurus and subject headings lists to enrich the output; 5) users are not comfortable with Boolean operators and other advanced means of searching and their search behavior follows the principle of least effort.

One of the fundamental issues in search strategy is when to stop. How does one judge when enough information has been gathered? How does one decide to give up an unsuccessful search? When is the optimal time to stop searching in one source and move to the next one? As a rule the lack of time or finance shortage are the main factors stopping the user searching.

7. Dealing with ICT the impact on information retrieval the technical and economical aspects are usually taken into account. The impacts of cultural, linguistic and interpersonal factors on information behavior are often neglected. Nevertheless information is created by a man and is requested by him. The important focus of our research was to look at the impact of ICT in social sciences on two main areas: information users and information needs, information behavior and searching strategy. Thus the ICT impact on social science information searching can be seen as following:

- deepen the knowledge and the capacity of different user groups in information retrieval issues; social science information users needs and their search behavior should be revealed for incorporation in ICTs policy and user involvement;
- assist decision-makers in dealing with information searching issues more effectively;
- enable development of search patterns for various social science information user groups; the meaning of 'relevance' and how it can be achieved should be contested.; as such it is necessary to examine the sense of user needs being portrayed and the interests expressed within current calls for greater user relevance and accountability;
- stimulate further investigation of most important attributes of social science searchers such as work task knowledge and its complexity, abilities to reveal information requirements using natural and retrieval languages, knowledge of the available Internet resources, the level of education and motivation, uncertainty of query formulation;
- facilitate exchange of experience on implementation of various search strategies among the information services – national and international - and share their experience in this field;
- development linguistic tools for large-scale data management in different branches of the social sciences and sharing of data provided by the information grid technology that seems to be a vital means of meeting the present grand challenge to e-social science: how to locate, access and integrate the content of information resources that embrace text, still and moving images and sound, encoded and described using different standards, and often incomplete, fuzzy, and complex. It is important to create closer links between research and practice and to combine more fundamental, small scale research or research focused on specific ICT tools with research that is much more linked to practice.

It is important to note that modern information systems are rapidly being replaced by radically different types of systems that encourage the use of nstructured natural language queries and facilities for automatically (or semi-automatically) reformulating queries through relevance feedback with users. Search engines as one of the primary ways that Internet users find Web sites are spreading at fast speed. That's why a Web site with good search engine listings may see a dramatic increase in traffic. Unfortunately, many Web sites appear poorly in search engine rankings or may not be listed at all because they fail to consider how search engines work. In our opinion, we are in great need of search engine optimization in ways that help social science information users to improve their searching skills.

There is, of course, still much to be done before we reach our long-term goals in implementing modern ICT in the field of information retrieval and formation so-called e-social science. First of all, we need an intelligent multilanguage information interface and flexible linguistic tools. In order to design such a system, it is necessary to understand what happens in the human-human information interaction, and why it happens, and to exact from this the functions that are required for any effective information searching. Efficient searches

require users who are highly familiar with the relevant information resources and how to manipulate them. Efficient searches require practice. Unfortunately social science information users are all too likely to be pleased with the results of their fast searches – no matter what they retrieved. It is quite possible that the spread of the ICTs would improve end-user searching and would stimulate the demand for teaching and facilitating tools as well as experienced intermediaries capable to help them online.

With The Eyes Of A Bee An Incoming Vision

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Abstract

For around ten years, a group of photographers from different regions of Italy, named Photomeeting, has been sharing ideas and images on an everyday base. They could remain in contact with each other also during journeys – while were in charge for work reasons or as care givers, e.g. grandmothers, for some weeks. In these cases they could participate in the written exchanges but not as easily send&receive images in attachment as used to do in everyday routines.

How an “ICT mediated community”, which main aim is photo and video art, has developed common strategies to cope with technical difficulties and/or “media misunderstandings”? How may these e-actors play in the scene of e-ping pong art? How did and do these long daily e-acquaintances and e-friendships work on personal self-determination, autonomy and reflexivity as lovers of photography - considered as a medium of creativity and exchange? How human bodies, faces and minds evoked by mutual words and images would construct webs of relations eventually tested via direct meetings at art openings or around a table rich of prints, wine and fruits? Does really the medium (world wide web) make any real difference in building confidence and relationship among participants, in empowering them, in creating new knowledge and new uses for web/computer based software and tools?

As the digital dimension changed perception of time, work,..., daily exchange in the web might provide new open air studios in a intimate wide web world. It is thus possible to ‘reflect’ on this theatre of shadows where - like in that mythical cave - our lives flow.

Based on archive research of a rich data-base collected by a member of the group, the research will explore the two ways inter-relation between photo/video construction and broadband communication, focusing attention on the potential power of the involved e-actors.

Introduction

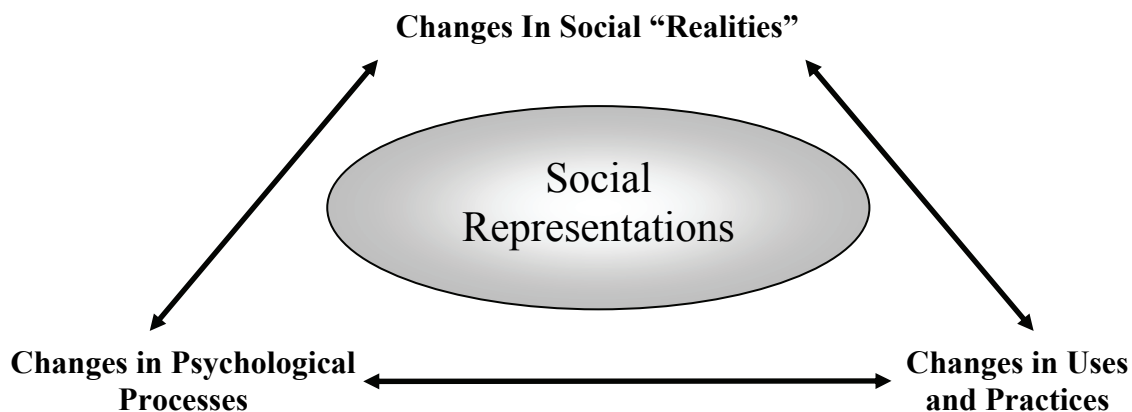
The rapid diffusion of Information and Communication Technologies in the last decades has proved to be a challenging and intriguing phenomenon for scholars interested in the intertwining between ways of knowing, thinking, experiencing new possibilities, on the one hand, and social practices and their underlying artefacts, on the other. On this vein, in previous work Contarello and Fortunati (2006) turned to the theory of social representations considering this theoretical approach particularly suitable for research. The aims were to study how the internet and the mobile were perceived and metabolised in the course of their ever-growing diffusion, in relation with appreciations and enthusiasms, but also caveats and concerns, expressed mainly within the sociological debate. The relations of these

technologies – together with health and well-being ones – and the human body were further analysed with the purpose of supporting with empirical data the answer given by “social thinking” to the progressive penetration of the latter by the former (cf. Fortunati, Katz and Riccini, 2003). Explorations of knowledge and images linked to the mobile phone, along time, were carried out (Fortunati and Contarello, 2005; Contarello, Fortunati and Sarrica, 2007), as well as to the internet and its relation with subjective well-being (Contarello and Sarrica, 2007). An extension involving young adults from five countries – Italy, Romania, Russia, Spain and the Netherlands – showed some interesting difference but substantially reaffirmed general trends across the respondents (Contarello, Fortunati, Gomez, Mante-Meijer, Vershinskaya, Volovici, 2005).

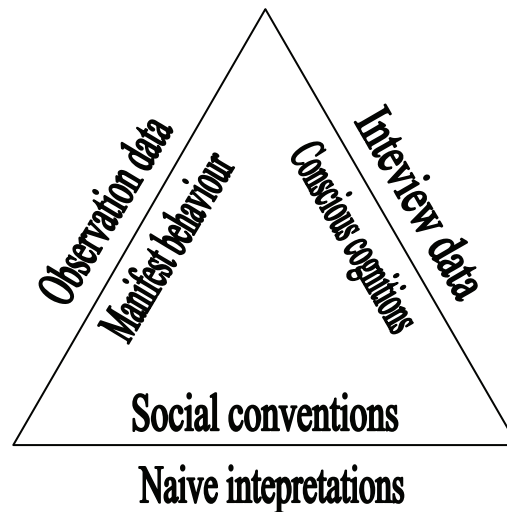
Within these years we had the fortunate chance to monitor early phases of diffusion of the technologies, with participants – university students – still showing a wide span of responses as regards uses and practices, mainly related to the internet. Asked to produce free associations, in brief questionnaires, the respondents offered nouns, adjectives, short periods which were submitted to quali-quantitative procedures and analyses. It was thus possible to explore the content and semantic field of representations of the internet and the mobile phone.

Empirical research conducted from the perspective of social representation theory ran parallel with the theoretical debate enhancing the co-construction and mutual incorporation of technical projects, cultural meanings, bodies and objects (cf. Callon, 1991; Latour, 1992a, 1992b, Mantovani, 2001). A social representation is defined as “a system of values, ideas and practices with a twofold function, first to establish an order in which to enable individuals to orient themselves in the material and social world and to master it, and second to enable communication to take place among the members of a community by providing them with a code for naming and classifying unambiguously the various aspects of their world and their individual and group history (Moscovici, 1973, p.xiii)”.

Following the opportune synthesis provided by Flick (1998; 2002) they are forms of social thinking which are shaped in the “space in between” the emergence of new social “realities”, practices and psychological processes. What we think has clearly an effect on what we do and how we act in everyday life, but this has in itself an effect on our thinking and feeling, as well as on the way these “realities” are perceived, accepted, but also constructed. The recurrent loops between the three points of the triangle are clearly stated in the theory, as well as the need of taking into account different scopes and strategies of research.



To state it with another helpful triangle, we can only tackle the rich thread of a social representation combining studies aimed to deepen the inter-relations among overt behaviour (through observation), conscious cognitions (through interview data) and shared knowledge (through interpretive efforts as members of the group/community) (von Cranach et al., 1982; 1992).



The range of literature on the spread, adoption and integration of Information and Communication Technologies in everyday life from different groups, i.e. the segment of the triangle relating to practices, has been expanding on different grounds (Katz, 2003; Mante-Meijer, 2003; Vershinskaya, 2003; de Gournay and Smoreda, 2003; Haddon, 2003; Ling, 2003; Mante-Meijer, Haddon, Loos, forthcoming). At the same time, the relation of ICTs' uses and practices with well-being (Contarello, 2003; Hamburger, 2004; Contarello and Sarrica, 2007), as well as the negative consequences of their diffusion, such as lack of trust (Huang et al., 2003) have been widely investigated.

Different interpretations and concerns with such exponential diffusion of ICTs have been suggested along time enhancing positive and negative effects of these "tools" (cf. for instance the already classics volume by Wallace, 1999, and Joinson, 2003, reviewing the psychology of the internet; in Italian cf. also Mantovani, 1995; Paccagnella, 2000; Marinelli, 2004).

In the present study, we had the opportunity to have access to a rich data bank consisting of the exchanges produced, for around ten years, within a group of photographers from different regions of Italy, named Photomeeting. With the purpose of sharing ideas and photos/images on an everyday base, they could remain in contact with each other also during journeys – while were in charge for work reasons or as care givers, e.g. grandparents, for some weeks. In these cases they could read the written exchanges but not as easily send&receive images in attachment as used to do in everyday routines.

The form of communication the group chose since its beginning has been a mailing list, thus an asynchronous form of communication in which every participant shares messages and attached-photos and images with everybody else within the community. The declared aim is to foster any visual expression, to facilitate exchanges, and to diffuse photography through free authorial voices. This choice of the list allows the participants to store a rich archive of images and/or texts and this facilitates the reuse and the re-thinking of images and words as time goes by. It is an intimate space, a protected room with an open window. A sort of "Hortus conclusus". Parallel to the mailing list, there is e web-site open to outsiders (<http://utenti.lycos.it/photomeeting>).

‘Reflecting’ on this theatre of shadows where - like in that mythical cave - lives flow and intertwine, based on archive research of a section of this rich data-base collected by a member of the group, the research aims to explore the *two ways inter-relation between photo/video construction and broadband communication* – as well as the *two ways relation between image construction and written dialogue* – focusing attention on the potential power of the involved e-actors.

We are then in the position of formulating our research questions focused on practices in this specific context and on the relation between practices and “verstehen”. More specifically, they can be summarized as follows.

Uses and practices. How, when, how much is shared in the flow of communication which links the members of the group? How could we monitor this flow? Our first question thus regards forms and contents of communication, with particular attention to the methodological choices we might adopt.

Communication strategies. How an “ICT mediated community”, which main aim is photo and video art, has developed common strategies to cope with technical difficulties and/or “media misunderstandings”?

Relations between online and offline communication. How may these e-actors play in the scene of e-ping pong art? How would human bodies, faces and minds evoked by mutual words and images construct webs of relations eventually tested via direct meetings at art openings or around a table rich of prints, wine and fruits?

Social networks. As the digital dimension changed perception of time, work and leisure, daily exchange in the web might provide new open air studios in a intimate wide web world. How does this new environment co-work in terms of group dynamics?

Relations between practices and social psychological processes. How did and do these long daily e-acquaintances and e-friendships work on personal self-determination, autonomy and reflexivity as lovers of photography - considered as a medium of creativity and exchange? Does really the medium (world wide web) make any real difference in building confidence and relationship among participants, in empowering them, in creating new knowledge and new uses for web/computer based software and tools?

Method

Participants

The time span we consider in the present paper is one month: December 2006. In this period 35 photographers – some professionals, most of them amateurs, from all over Italy, particularly from Rome - exchanged 875 emails and a total of 557 photos. The participants’ age range between mid-thirties and almost eighty, with a high prevalence of over fifty. The mailing list has no official moderator; it has been launched and is actually ruled by an Art Director (bfi-afi) and is mainly composed by men (30 on 35).

Procedure

Our method and procedures oscillate between virtual ethnography (the second author is a long term member of the group), web usage mining and social network analysis. It owes also a lot to grounded theory, its main aim being to discover unexpected trends more that testing pre-existing views and models. Consequently, the material submitted to exploration was coded, by the third author, with the help of Atlas.ti (www.atlasti.com): a visual qualitative data analysis software, specifically designed for grounded theory, which proved to be an asset in terms of flexibility of coding, retrieving, comparing and matching bits of information. First of all, sent and received messages were coded considering both sender and (explicitly

addressed) receiver. Time of delivery was taken into account as well as contents which were assembled in the following categories/topics: compliments, general information, texts referring to photos, requests, thanks, wishes .The category “ Other” refers to messages overlapping one or more of the previous ones.

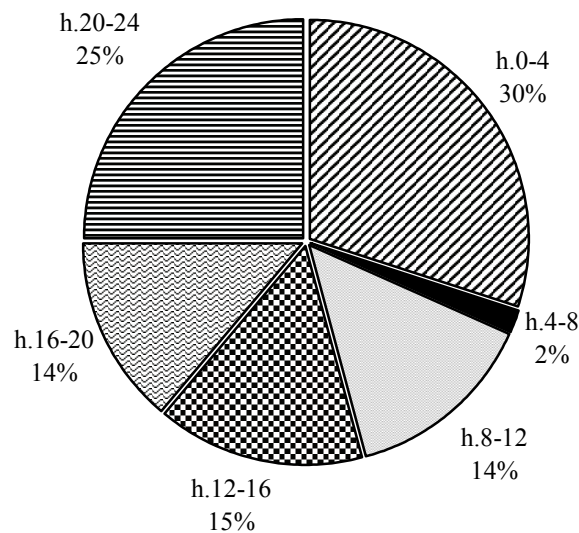
Then Bales’ coding scheme (IPA) was taken into account and adapted to extract the interactions among the participants.

While reading and coding the massive original documentation, it was possible to note that some “conversational styles” called for attention, so it was decided to “scan” deeper the messages of five participants – particularly active in the considered period – in order to let their styles emerge.

Results

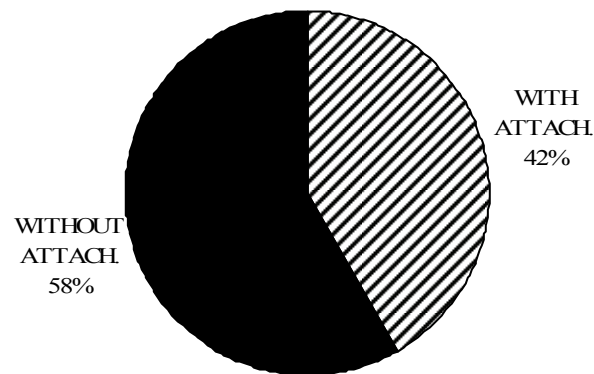
Uses and Practices

Times



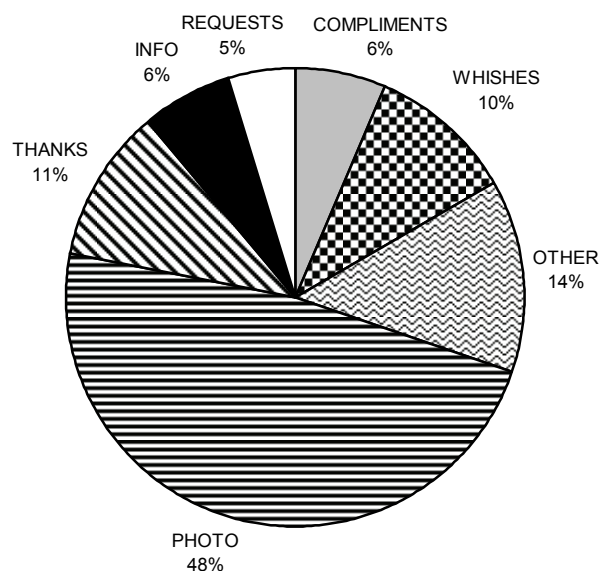
As underlined in official brochures (cf. Photomeeting, “All Tastes but One”, 2005) communication is alive 24 hours a day with a strong prevalence during evening and late night hours.

Messages



Almost 50% of e-mails are accompanied with attached images which, as we will see later, are very often ping-ponged by the participants, re-launching themes and suggestions.

Topics

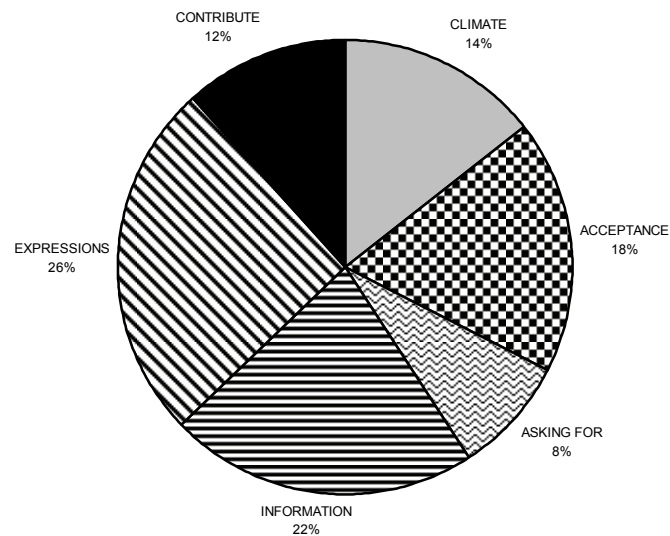


As we could expect, the conversation is basically addressed to share ideas and opinions related to photos and images, as well as to look deeper into them benefiting of the chance of this multiple perspective. But a great many of the communication exchanges run about positive and rewarding aspects of daily life, greetings, compliments and wishes. We remind, however, that it was Christmas time.

Communication Strategies

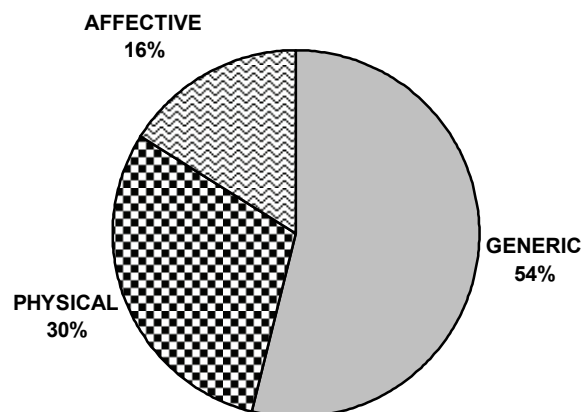
The interaction process analysis shows a minimum presence of negative remarks (5.4%) which are almost always anticipated or followed by positive buffers. In the considered period only one flaming episode occurred. Positive messages take different forms as reported in the following figure.

Positive Relations



Opinions and information exchanges play the main role, but also contributions and supporting remarks (even greetings show affection and embodied tones) create a sort of net where care and attention appear to provide good and safe terrain to expose oneself and one's works in progress. A strong image of acrobatic exercise played safely thanks to an underplayed net seems to be evoked.

Greetings

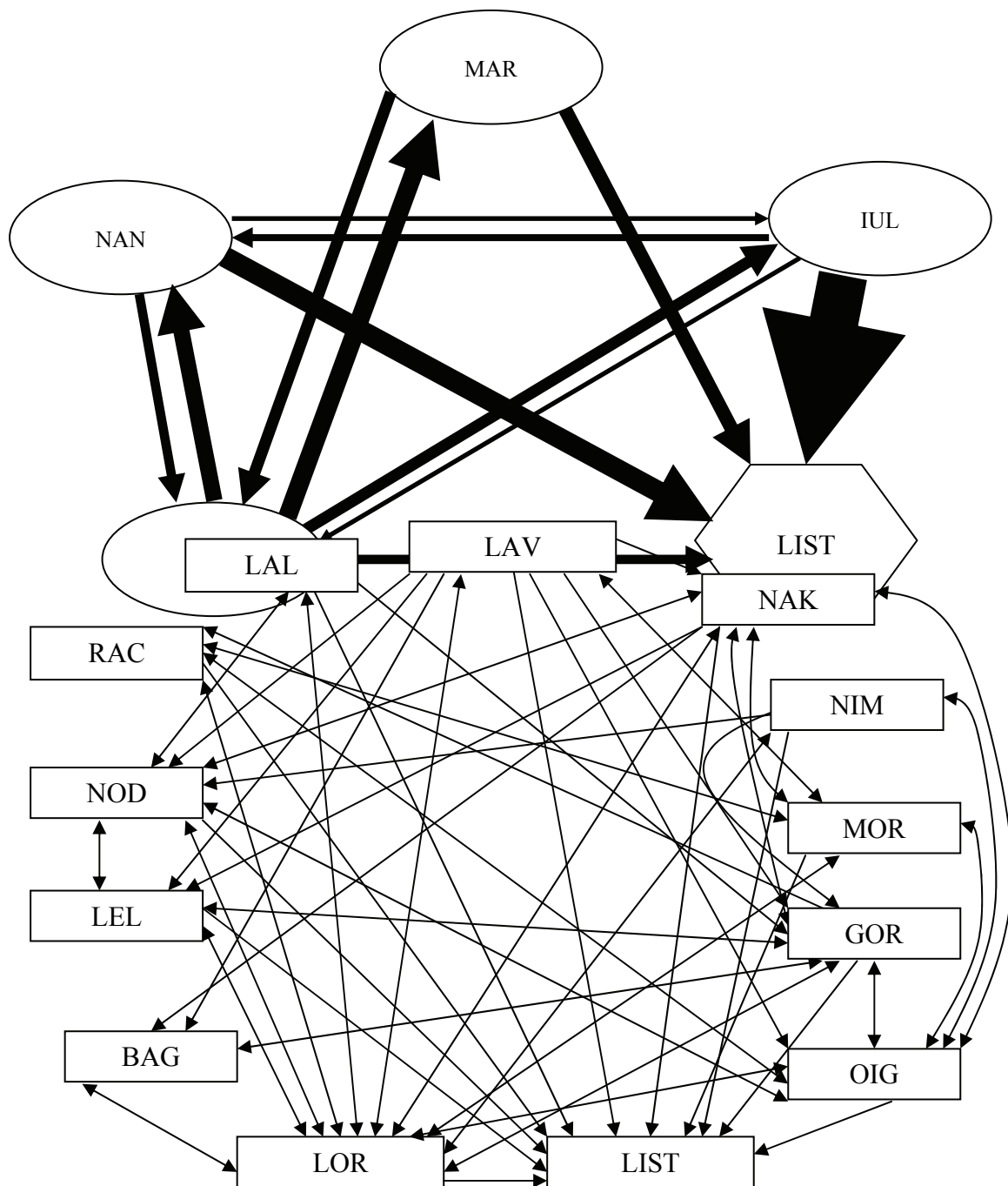


Relations between Online and Offline Communication

In several cases, messages refer to real-life meetings and exchanges among some of the participants. Also telephone calls are mentioned. Presence to openings and exhibitions of one or the other is not rare.

Social Networks and Communicative Genres

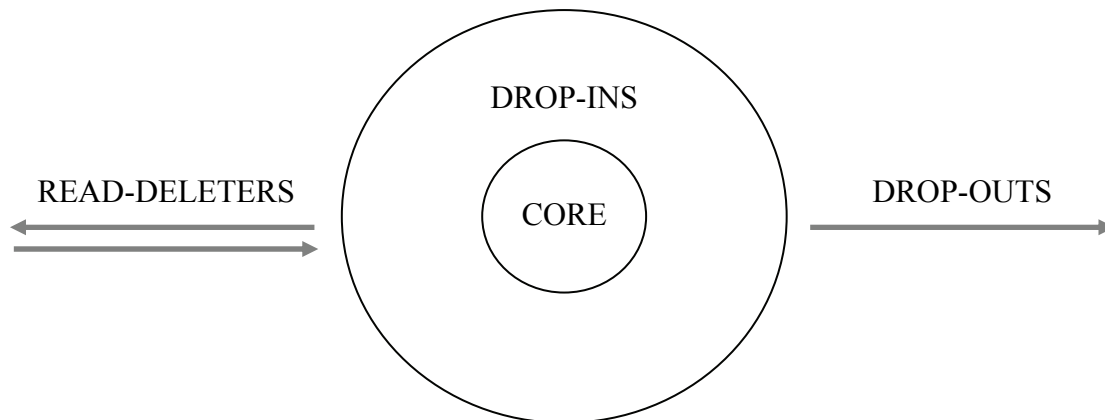
The most active participants in the considered time – four women and twelve men – are reported in the following figures in a sociogram-like display.



Pseudonyms were used in order to guarantee privacy, very much valued in the group. Although every message reaches all the participants' mailing boxes, it often happens that an email is explicitly addressed to one or another member of the list, shaping a kind of a dialogue, held by two persons but potentially "heard" by all. On this base the graphs have been constructed. In the first diagram the relative frequency of messages is also taken into account, while this was not possible in the second diagram in terms of readability of the figure. What appears clearly is a wide use of the network: the communication structure tends

to optimize the opportunities offered by the technology reflecting an almost complete network of interaction.

The functioning of a typical mailing list can be represented by the following model:



The “Core” represents the group of the most active users, the ones who usually give sense to the e-mail community and are also part of an off-line/real group, while the “Drop-ins” are less expert and active but still involved in the group’s discussions. “Read-deleters” are official members but rarely participate and/or contribute to the group’s life. Finally “Drop-outs” are persons that, after signing-in, decided to leave the list mainly because they discovered, after a short period, it was not of their interest (cf. Tidwell, 1999). How does this apply to our specific case?

Lets just focus on the “Core” and the “Drop-ins”. Analysing the messages, contents and relations among the most active participants, we noted the presence of:

- High relevance of emotional scaffolding (encouraging, approving, positive feedbacks, etc.)
- A kind of personal networking interaction, typical of a group of friends (cf. Ravitz, 1995)
- The use of the mailing list as a “polyphonic arena”, where all members - not only the experts - can show their images putting them on a round table but also “read” and comment them, asking and giving information, creating a sort of open on-line writing (cf. Calvani and Rotta, 1999).

We also found of particular interest some “communicative genres” or styles (cf. Zucchermaglio and Talamo, 2003), all more oriented to an artistic and emotional sharing of photos and images rather than focused on technical aspects: The first is “free exposure” of one’s photos, using a reply to a previous individual message (sometime posting a new one) as an opportunity to offer a photo to the public attention; the second is a “narrative style” used to make explicit the artistic purpose of a photo or an image, commenting or presenting it also using poetry to suggest the feeling of an experience occurred (and photographed); the third is “ping-pong” were photos are re-used and modified by others, joking with them and interpreting them with almost no use of words to explain why or, reverse, where words are used to “contaminate” an original to suggest new interpretations of it.

Then we could conclude noting that the group’s communication is oriented to facilitate interaction and confidence and, at the same time, to push each member to research his or her

own artistic identity in order to distinguish one from the other through a collaborative narration and safe self-exposure.

Concluding Remarks: Old-New Questions

Much more should and will be said regarding *relations between practices and social psychological processes* such as personal self-determination, autonomy and reflexivity as lovers of photography as well as on the *two ways inter-relation between photo/video construction and broadband communication* , on the one hand and *between image construction and written dialogue*, on the other.

But also from these preliminary hints we think we can draw some preliminary conclusions.

The specific context we analysed shows a group of first generation users of the internet and the facilities it provides. They seem to maintain in the web some habits from the past: using emails in a similar vein than letters, appreciating switches between the online and offline (mainly photographic) worlds. Yet, the virtual macro-context provides something very special: *distance*, which appears to “matter” in a positive way (reverse echoing Olson and Olson, 2000) and an *internal-external* dimension in which the two poles appear to play as two faces of the same coin: perhaps it is just because the internal space designed by the group seems to be so ‘safe’ that it allows – maybe requires – openness to a wider exposure. This particular context of communication seems thus to allow its actors to fairly cope with the dialectic opposition between desires to belong and need of uniqueness (cf. Brewer’s optimal distinctiveness theory, 1991).

Various strategies are put forward in order to prevent possible misunderstandings, the always-present peril of computer mediated communication. Courtesy-moves are highly present and helpful. Several dialogic exchanges almost between all the actors – although frequently very short - construct a thick thread of relations. Silence, or better the absence of negative feedback, also play a role: sometimes positive and empowering, sometimes expressing – or being perceived as – lack of interest or disapproval. This deserves more attention. Other themes, as well, mainly the search & practices of individual artistic authorship appear to have in this context specific nuances and effects: this theme is perhaps the most important to investigate.

Like honeybees, social animals who look at the world through compound eyes made of hundreds of small simple eyes, the observed e-actors appear to re-launch different gazes and perspectives, through daily natural vision as well as through camera lenses.

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Advantages And Risks Of Internet Health-Information

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Abstract

Internet is changing how people receive health information and health care. It is a rich source of information, but it is unregulated. Some information is wrong, while other information is confusing for vulnerable people. Online support and discussion groups can provide comfort and valuable information, however, the Internet cannot replace face-to-face contact with health professionals. These risks are currently raising important cultural, social, economic and political issues which merit a comprehensive investigation involving social and technological sciences.

The MIDIR project considers the role of the Internet to the access and diffusion of the health information. In particular the project studies this theme using an integrative and multidimensional approach.

The study examines the risk related to the access and interpretation of health information. The study spotlights the importance to understand how patients utilise this information. Some patients actively search information to assume more responsibility for their health, others search information in consequence of confidence failure in health care provision.

Afterwards the study intends to develop new theoretical frameworks and methodologies:

- to explore the technology-society relationship in the context of health care settings;
- to analyze the risk relative to Internet health-commerce.

The research results will contribute to the debate about the education needed to support health care consumers.

Index Terms: Internet, health information, patient-physician relationship, e-commerce

1. Introduction

The concept of e-Health has been in use since the year 2000, it includes much of clinical informatics, but gives priority to the delivery of medical information, services and care rather than the role of technologies. No single common consent exists towards the definition of this concept because it comprehends a “series of characteristics specified at varying levels of generality and detail” [1].

But despite that e-Health is a global topic. E-health systems and infrastructures are now considered as central to the future of efficient, safe, citizen-centred health care and high quality in different key application areas:

- Electronic Medical Document (including clinical administration systems, patient records, digital archiving systems);
- Telemedicine;
- Internet-based services and technologies.

E-health represents an opportunity for increasingly consumers that are using the World Wide Web to get information about health.

It offers the advantages that include:

- the possibilities for improving the accessibility, efficiency and quality of care: e-health provides the care-provider at the specific time and in the specific place with the information she or he needs for performing their task;
- the opportunities to improve the patient/physician relationship: the evolution of patient-physician communication shows that new technologies have a relevant impact on the way in which patients and medicals interact.

There are many potential benefits for patients and physicians who use Internet:

- patients may feel more comfortable in addressing sensitive, complex or personal issues;
- Internet can solve problems related to large distances or patients' disability;
- patients can influence physician prescribing decisions by presenting product information they find online.

Internet has the potential to educate health consumer, by giving information on health and health services, supporting patient choice, guaranteeing convenience, anonymity, and quantity of information.

Apart from advantages, there are also threats.

Many attentions have been aimed to the quality of online health information, and the negative effects that poor information has on health. The information is sometimes incomplete and often inaccurate. For this reason it is necessary to examine the quality of health-information, and to consider the Internet as radically different respect to other information sources.

In this paper we illustrate, first of all, the patient- physician relationship and afterwards we describe how patient utilise health-information underlining the advantages and the risks of Internet use.

The use of Internet in the healthcare [2] has a variety of advantages (support for interpersonal interaction and social support, accurate information, anonymity), but has also several disadvantages (unequal access, cost, technical language), obstacles (extreme variability in the quality of the information, commercial interests that influence content, no-preservation of personal privacy; disorganization, complex medical language, impermanence), and dangers (lack of peer review, inaccurate information, risk-promoting messages, online reinforcement of pathologies).

With the World Wide Web a new media has appeared, which has enhanced the risk associated with information, interactivity, free accessibility, and with e-commerce of health products that raise many questions involving what sort should be expected by extensions of the medical Internet.

2. The Patient-physician relationship in the era of Internet

The World Wide Web is rapidly changing the physician-patient relationship [3]. By access to medical information, it is possible for patients to assume much more responsibility for their health care.

However, in doing so, patients challenge the traditional role of the physician in providing care. How they use online medical information influences their relationship and influences health outcomes. If correctly used, in the "Internet Age" physicians and patients have a technological resource to make better the patient-medical relationship. In fact if the physician assists patients in the information-gathering process, an enhanced relationship may result.

The patient-physician relationship is fundamental to provide and receive excellent care, and in the process of healing. Rather, using the Internet, physician utilizes a different way to communicate with patients through e-mail. E-mail communication between patients and

physicians is becoming part of medical practice. For incorporating e-mail consultations into routine medical practice it is necessary to proceed on the basis of secure evidence.

It is important to understand the following aspects related to the communication between physicians and patients: how the communication by email can be integrated with other modes to communicate; what are the patient and physician preferences in the use of emails; how to identify people that most likely can benefit from email communication.

The first step for this study is to value the potential risk and benefits of email [4]. It is certain that this instrument presents very clear advantages in different area:

- 1) Convenience:
 - advantages in time and space for physician and patient. Emails can be sent and received at any time from anywhere - mobile phone, via computer, personal digital assistant or digital television;
 - email reduces the need for face-to-face consultations;
 - email is convenient for information that patients have to remember or to write down.
- 2) Access
 - email facilitates the access to care for patients with physical disabilities or patients that live in a remote area.
- 3) Information sharing
 - the opportunities for patients to use friendly medium to ask clarification after a face-to-face consultation;
 - the opportunities for patients to discuss the content of messages with friends or family to improve the understanding of the care.
- 4) Satisfaction
 - traditional barriers of social differences, age, and non-familiarity dissolve in the informality of electronic communication;
 - free style of writing;
 - anonymity for patients;
 - speed of communication;
 - opportunities for groups that are difficult to reach by face-to-face contact.
- 5) Quality of care
 - physicians can easily consult other professionals to verify the decided care.
- 6) Efficiency
 - opportunities to improve the diffusion information on healthy behaviour to several people simultaneously;
 - cost savings.

Patients see e-mails as a convenient way to interact with physician who is important to them [5].

With the continued increased develop of Internet, the email can be a simple, valid, convenient and inexpensive mechanism for communication. It can support the health care distribution process by allowing written follow-up clues, test results, as well as, a means for patients to easily contact their physician.

But what are the risks?

The potential disadvantages of email use in delivering health care can be tied to:

- the social disparities by permitting preferential access to young middle class adults;
- the fact that the scope of non-verbal communication is very limited;
- the impossibility to have a direct contact with the patient;
- the risk of communication or diagnostic errors;
- the impossibility no has quick responses to requests that need of prompt actions;
- the patient privacy.

The second step is to understand that the revolution in communication exchange between individuals is most evident in the area of virtual communities. Virtual communities benefits come from the absence of traditional barriers to access. Online anonymity can be helpful for those who have embarrassment and can support all users to draw their health conditions. However the lack of professional facilitation or moderation in most virtual communities may lead to inappropriate use or to the diffusion of inaccurate messages. There are also risks that participation in virtual communities may become an addictive drug for some users. The risks of Internet use are most commonly associated with the interactive functions of the Internet. An uncontrollable Internet use can determine a detriment of other activities such as social life or work.

Finally we can assert that Internet instruments offer to physicians an opportunity to improve the consciousness of patients and enhance their satisfaction, they give the opportunity to increase the involvement of patients in their care, moreover they improve access to health care information and communication possibilities between patients and physicians, but must never replace the interpersonal contacts that are the basis of the patient-physician relationship. Actually, the idea of “virtual physician” or “virtual interaction with physicians” can disturb most patients. These patients believe only in interpersonal contacts with physicians and they assign a relevant role to a face-to-face communication. This negative vision is tied to the absence of a very important element: the trust, that is a fundamental component of the patient-physician relationship; without trust, this relationship may not become established. Good communication between patients and physicians is important not only to reduce the risk of misunderstanding but as a part of the healing process. The vulnerability of patients and their need for care force them to trust physicians. When this trust is created, it can generate an interactive process that increases satisfaction, adherence to treatment, and continuity of care.

3. How Patients Utilise Internet Health Information

With the development of the Internet, more people use their computers for searching health information advice. But it is very important to understand what types of health advice are consumers getting from the Web [6]. Studies in different countries demonstrate that the kinds of health information searched online are:

- information about a specific medical problem;
- information about a certain medical treatment;
- information about nutrition, diet, or nutritional supplements;
- information about alternative medicines or treatments;
- information related to health insurance;
- information about stress, depression, anxiety or mental health issues;
- information about a particular hospital or physician;
- information about experimental medicines or treatments;
- information about environmental health hazards;
- information about vaccinations or immunizations;
- information about problems with alcohol or drugs;
- information about how to quit smoking.

These kinds of information underline that today patients want to become better educated about healthcare. Internet represents an unprecedented opportunity for patient self-education; for this reason patients see the Internet as an important information resource.

In addition, access and age barriers are rapidly disappearing and patients express the need in using the Web to develop: consumer-oriented health care models; the increase of health

information; actions that increase the possibility to access to best care; importance of self-care and prevention.

However, patients have a misplaced faith in the quality of health information available on the Web. Several questions remain unsolved. How health professionals guarantee the quality of information? What kind of health-information is on the Internet? But especially what are the risks of Internet health-information?

4. Health Risks And Benefits: The Role Of Internet

Internet that provides information about diagnosis and treatment, health promotion and health risk assessment are proliferating [7]. But we have to consider that the new world of e-Health represents many new opportunities to assure high quality of information, products and services but also risks.

The very clear advantages are that e-Health can:

- represent a helping support for health management;
- increase people satisfaction;
- guarantee fewer calls concerning administrative information;
- allow interactivity and interpersonal communication in any time and any where.
- furnish the possibility to specify tailored messages in a variety of formats: Users can select links, sites, and specific messages based on language level, educational and preferences for format and learning style, often at lower cost;
- allow anonymity. Users may access information on sensitive topics without the face-to-face relationship.

For this reason it is very important to understand: what kind of health-information is available on Internet; how much it can be considered reliable; how can we tell the difference between safe and unsafe health information [8]. These are very important questions when we consider that many people trust in the Internet to learn about medical treatments or make decisions about care. However, increasingly Internet users and medical professionals have to take into account and carefully consider the quality of online health information. Several criticisms define health information on the Internet bad and even dangerous, erroneous, inaccurate, fraudulent, incomplete and misleading.

For example, Internet diffuses information about suicide methods; moreover several evidence indicates that Internet use promotes sexual risk taking, in particular, people who uses Internet to find real-life sex partners are more likely to contract sexually transmitted diseases.

For users with high cultural levels, Internet has become an efficient facilitator of practices and behaviours. These consumers have confidence in health information provided by some objective sources. They know which information sources can trust, and how to search other objective source to improve their knowledge.

Many authors show the difficulty to define general criteria for the classification of quality standards. Fundamentally, health websites should be qualified by the quality of health information. The following criteria are being recommended as necessary for guaranteeing the quality of health-information:

- credibility, that comprises: the source, currency, relevance/utility, and editorial review process for the information;
- content that comprises: accuracy; disclaimer; completeness;
- disclosure that underlines the importance that patients are informed about collection of data about them, and how the data is used;
- external links that lead patients to other authoritative sources;

- design: that encompasses accessibility, logical organization (navigability), and internal search capability;
- interactivity: the possibility of interactivity provides a unique opportunity to establish direct contact with experts;

These criteria represent a base set that patients should consider finding good quality health information in this rapidly changing field, however they are not sufficient to solve a problem, due to the fraudulent behaviour of some websites.

5. Internet Health-Commerce

The World Wide Web emerged in the last years as an interactive channel, owning all the characteristics to be utilised as a self-service. It permits real time answers to patient' requests, because it is an impressive source of health information, 24 hours available.

Internet permits consumers to obtain extensive medical information to help them understand health treatment options. For these reasons the use of Internet to buy health products is growing rapidly. Many peoples benefit from the convenience of this new instrument. Drug sales over the Word Wide Web can provide benefits to consumers. These benefits are many and include:

- access to drugs beyond national border;
- opportunities of shopping 24 hours a day; and a wide set of pharmaceutical products;
- privacy for users who don't want to buy their medical products in a public place.

These benefits help to develop a health-market on Internet, where it is possible to identify consumers' preferences, tailoring the offer according to individual predilection in micro market area.

Several pharmacies on Internet allow the user to search drugs specifying a measure of convenience, safety and privacy, offering detailed information on drug interactions, and utilizing the e-mail of customers to give information about orders. Frequently these pharmacies sell drugs for less than traditional pharmacies. Finally, the use of information and communication technology to transmit prescriptions from physicians to pharmacies can reduce errors in prescription.

Online shopping for health products offers many benefits for consumers, but it also presents a number of serious risks.

In fact, consumers are now being threatened by the fraudulent Internet businesses that trade products illegally. In particular, trading medical products or buying some medical products from another country online may be illegal in some countries, therefore, before buying a product, it is necessary to understand if it is legal.

Moreover there are many reasons why health-products bought through the Internet could represent a danger to health. For example some health-products could be:

- fake;
- strong or weak;
- out of date;
- composed of dangerous ingredients;
- stored not correctly;

Also:

- efficacy may be lacking: the Internet use can determine difficulties to distinguish between products that met the requirements of consumer' government and those that does not met;
- instructions for use could be inadequate: this is a very grave risk because to be used properly, medical products need to be accompanied by accurate instructions;
- quality may be not assured: the product could contain dangerous ingredients;

- health products sold through the Internet may circumvent the regulatory protection provided by authorities and government for the health of citizens;
- reimbursement could not be possible;
- seeking health treatment through the Internet, can determine a waste of valuable resources because the treatments may not help;
- products may not be allowed in the country of the consumer, moreover it is possible that health-products that are available only by prescription in one country are available without prescription, can be without rules in another;
- medicines with the same name may be different in different countries and countries may have different standards for the quality of medical products and their manufacture;

Internet is a valuable source of health information on several topics such as therapies, health-products, and medical organizations [9]. When properly used, it allows quick and easy access to such information from online medical libraries, health associations and government agencies.

However, the quality of health and medical product information on the Internet varies, and it is often difficult for the Internet users to identify the true source of the information and to determine whether it is reliable and complete.

6. Conclusion

Today people are more active than in the past making decisions about their own health care. Internet can help to access health information. In fact, patients often use Internet to validate and extend upon information they have heard or read elsewhere.

However, there is little knowledge on consumer's searching behaviour, on how he/she is influenced by the on line information and on its reliability.

There is a growing attention on Internet as a means to improve health and health care delivery, but it is fundamental to consider the impact on the use of Internet, in particular discussing the privacy issue and the quality of information connected to the development of e-health.

There is some concern surrounding privacy of health information on the Internet. Many health sites permit patients to create a personal web page where they can obtain health information tailored to their age, anamnesis, gender, and so on. Frequently people that access to these web sites are not anonymous, and health sites sometimes do not adopt the necessary privacy policies.

Frequently consumers, which increasingly turn to the Internet for health information, find health sites that provide only basic and inaccurate information.

One of the key roles of the medical professional in the past was to include and regulate a base of health knowledge. Actually the possibility to provide and use distributed knowledge and to have many sources of information is deeply influencing and characterizing society. Obviously physicians will continue to have a key role in the health knowledge, but we have to understand that they will have a different manner to communicate with patients. In fact, one of the most important advantages of the Internet use is that it promotes the opportunity for users to interact with more health professionals than in the past.

On discussing about the impact of online health information and online interaction on the traditional physician-patient relationship, we emphasize that Internet are transforming such relationships.

Internet does not have the capability to reproduce the traditional relationship because of the impossibility of the physical presence. In fact medical practice includes complex processes as diagnosis, treatment, prognosis and these processes require the presence of the patient for several activities. Therefore, in conclusion we can observe that Internet can modify and

integrate the traditional physician-patient relationship but, at the moment, cannot replace this relationship.

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Russian Teachers' Attitudes about Media Education *

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Abstract

The year 2002 was marked by the important event in the history of the Russian media education movement. The academic-methodical institution of the Ministry of Education of the Russian Federation has registered the new university-level specialization (Minor) "Media Education" (03.13.30) within the education area. In other words, for the first time in its history media education in Russia has gained an official status.

However are the Russian teachers ready for the implementation of the media education ideas? What is their general attitude to the problem of media education in school and university? What objectives are the most important for them? To what extent do they use media education elements in their lessons?

These are the questions that we tried to answer by the questioning of 57 teachers of secondary schools. The analysis of the conducted questionnaire among teachers of secondary schools showed that realizing the great importance of the media in the contemporary information society, three quarters of them support the idea of media education at schools and 58% believe that a new major for pedagogical institutes needs to be introduced - "Media Education". Most of teachers justly think that the combination of the autonomous and integrated media lessons is the most effective way today for the development of media education in Russia, and therefore - for the increase of media literacy of the young generation.

In the UNESCO documents "*Media Education*

-deals with all communication media and includes the printed word and graphics, the sound, the still as well as the moving image, delivered on any kind of technology;

-enables people to gain understanding of the communication media used in their society and the way they operate and to acquire skills using these media to communicate with others;

-ensure that people learn how to

* analyse, critically reflect upon and create media texts;

* identify the sources of media texts, their political, social, commercial and/or cultural interests, and their contexts;

* interpret the messages and values offered by the media;

* select appropriate media for communicating their own messages or stories and for reaching their intended audience;

* gain or demand access to media for both reception and production.

Media education is part of basic entitlement of every citizen, in every country in the world, to freedom of expression and the right to information and is instrumental in building and sustaining democracy" [Recommendations Addressed to the United Nations Educational Scientific and Cultural Organization UNESCO, 1999, pp.273-274].

Therefore, media education in the modern world can be described as the process of the

development of personality with the help of and on the material of media, aimed at the shaping of culture of the interaction with media, development of the creative, communicative skills, critical thinking, perception, interpretation, analysis and evaluation of media texts, teaching different forms of self-expression using technology. Media literacy, as an outcome of this process, helps a person to actively use opportunities of the information field provided by the television, radio, video, film, press and Internet [Fedorov, 2001, p.8].

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These are the questions that we tried to answer by the questioning of 57 teachers of secondary schools (schools NN 12, 27, 36, 37, 38 and others) in Taganrog, Russia. The information on age and gender of the teachers is in the Table 1.

Table 1. The Number of Teachers, their Age and Gender

Age	Number of teachers in this age group	% of teachers	Number of female teachers	Number of male teachers
21-30	10	17,54	7	3
31-40	12	21,05	8	4
41-50	11	19,30	7	4
51-60	12	21,05	7	5
61-70	12	21,05	10	2
Total	57	100	39	18

Undoubtedly, my survey cannot claim for the total representativeness. On the other hand, its results seem to us characteristic of the media education process in general, the more so as many of its issues reecho with the findings of the research of media education tendencies in 12 European countries [Hart & Suss, 2002].

The results of the survey are presented in the Tables 2 - 6.

Table 2. The General Attitudes of Teachers to Media Education

Age, Gender of teachers	Attitudes of Teachers to Media Education of Pupils and Students									
	There is no need in media education of pupils	Media education must be part of the curriculum	Media education should be in an elective or a club in Schools	There is no need in media education of university students	Media education should be part of the curriculum in the pedagogical institutes & universities	Media education should be an elective course for university level students	A new area of qualification (Major) –“Media Education” should be introduced into the pedagogical institutes	Media education of pupils and students should be integrated into traditional obligatory courses	Media education in school and university should be autonomous, as a matter or a course	Media education in school and university must be a synthesis of autonomous and integrated lessons
	Number of teachers (in %) who chose this variant of the answer:									
Age 21-30/total	0,00	60,00	30,00	0,00	80,00	10,00	40,00	40,00	20,00	60,00
21-30/men	0,00	66,67	0,00	0,00	100,00	0,00	33,33	33,33	33,33	33,33
21-30 women	0,00	57,14	42,86	0,00	71,43	14,28	42,86	42,86	14,28	71,43
Age 31-40/total	16,67	83,33	33,33	0,00	83,33	25,00	83,33	41,67	25,00	50,00
21-30/ men	0,00	50,00	25,00	0,00	50,00	25,00	100,00	50,00	25,00	50,00
21-30/women	25,00	100,00	37,50	0,00	100,00	25,00	75,00	37,50	25,00	50,00
Age 41-50 /total	9,10	72,73	36,36	0,00	54,54	45,45	72,73	45,45	27,27	63,64
41-50 /men	0,00	50,00	50,00	0,00	75,00	75,00	100,00	50,00	25,00	75,00
41-50 /women	14,28	85,71	28,57	0,00	42,86	28,57	57,14	42,86	28,57	57,14
Age 51-60 /total	25,00	41,67	50,00	8,33	50,00	16,67	58,33	50,00	25,00	41,67
51-60 /men	20,00	40,00	60,00	0,00	60,00	20,00	100,00	40,00	20,00	40,00
51-60 / women	28,57	42,86	42,86	14,28	42,86	14,28	28,57	57,14	28,57	42,86
Age 61-70 /total	16,67	58,33	33,33	8,33	33,33	8,33	33,33	50,50	25,00	41,67
61-70 /men	0,00	100,00	50,00	00,00	50,00	0,00	50,00	50,00	0,00	0,00
61-70 / women	20,00	50,00	30,00	10,00	30,00	10,00	30,00	50,00	30,00	50,00
All age groups/total	14,03	63,16	36,84	3,51	56,14	21,05	57,89	45,61	24,56	50,88
All age groups/men	5,55	55,55	38,89	0,00	66,67	27,78	83,33	44,44	22,22	44,44
All age groups/women	17,95	66,67	35,90	5,13	56,41	17,95	46,15	46,15	25,64	53,85

The analysis of Table 2 shows that the majority of teachers believe in the necessity of media education of pupils in the form of a mandatory subject (63,16%) or as an elective (34,84%). The same is true concerning the obligatory (56,14%) or elective (21,05%) media education for university students. 57,89% of the teachers questioned (83,33% of men and 46,15% of women) have also expressed their support of the introduction of the new pedagogical Major “Media Education” in higher education institutions. In addition, the mandatory media education for pupils/students and the suggestion for Major in “Media Education” have gained the strongest support in the age group of teachers between 31 and 40 years (83,33% of voices in all questions).

The teachers that took part in our project, think that media education of pupils/students should

be integrated into the mandatory courses (45,61% without any noticeable gender or age differences), autonomous (24,56% without any major gender or age differences as well), or the combination of both (50,88%).

Only 14,03% of the teachers oppose media education for pupils claiming its uselessness. There are 3 times more of the women's voices here than of the men's, and older generation predominates (in the age group between 21 and 30 years there is no single person who is against media education for schoolchildren).

However, even the teachers' opposition changes its point of view when it comes to the status of media education for university-level students. Just 3,51% of the teachers reject it. By the way, this group consists entirely of women older than 50 years, who are probably too conservative to change their traditional opinion about the teaching process.

In general, more than 75% of the teachers in this or another way do support media education for pupils and students, and 58% of them believe that it is high time to introduce the new area of expertise for universities - "Media Education". It proves the point that the intense development of the media evokes the adequate reaction of Russian pedagogues - they realize that life in the world of IT s and mass communication boom is demanding media literacy to the extent not less than it is demanding the traditional literacy.

It seems interesting to me to compare several positions of Table 2 with the results of the questionnaire of 26 experts in media education around the world (media educators from 10 different countries participated, such as O.Baranov, R.Cornell, A.Korochensky, B.MacMahon, J.Pungente, S.Penzin, L.Roser, K.Tyner, E.Yakushina, and others) that I conducted for UNESCO in 2003 [Fedorov, 2003]. The difference in the opinions of teachers and experts featured most strongly in their attitude to the autonomous media education. In contrast to 25,64% of Russian schoolteachers, only 7,69% of the experts in the field think that media literacy should be taught in separate courses/lessons. There is no significant difference between the support for the integrated media education: 46,15% of Russian teachers vs. 30,77% of the experts. The number of advocates of the combination of the integrated and autonomous media education in these two groups is even closer: 53,85% of teachers compared to 61,54% of the experts. On the whole, majority of Russian teachers and international experts agree on the point that the most promising way for the development of modern media education is the union of autonomous and integrated lessons with schoolchildren and students.

The results of the teachers' answers to the questions about their attitude to main aims of media education are systematized in Table 3.

Table 3. Teachers' Opinions about their Attitude to Main Aims of Media Education

Age/gender of teachers	Media Educational Aims													
	Encouraging the development of the aesthetic taste, perception, evaluation of the aesthetic value of a media text, appreciation of masterpieces of media culture <i>развитие вкуса, восприятие, оценка эстетической ценности медиа-текста, appreciation of masterpieces of media culture</i>	Development of the critical thinking and critical autonomy of the personality towards media texts.	Protection from the harmful influences of media.	Satisfaction of different needs of the audiences	Teaching practical work with media technology	Development of the audiences' skills for political, ideological analysis of different aspects of media.	Development of the skills of perception, understanding and analysis of media language.	Development of the audiences' skills for the analysis of media texts in the broad cultural and social contexts.	Preparing young people for living in the democratic society.	Development of the communicative skills	Development of the ability for self-expression with the help of media technology, creation of media texts.	Teaching and learning the knowledge about the history of media, media culture	Transmittance of the knowledge about the theory of media, media culture	Development of the skills for the analysis of different aspects of media, media culture in terms of moral values, and psychology.
	Number of teachers (in %) who chose this variant of an answer													
Age 21-30 total	60,00	100,0	20,00	40,00	30,00	50,00	20,00	60,00	10,00	40,00	0,00	20,00	20,00	30,00
21-30 /men	33,33	100,0	33,33	33,33	0,00	66,67	0,00	66,67	0,00	100,0	0,00	40,00	20,00	60,00
21-30/women	71,43	100,0	14,28	42,86	42,86	42,86	28,57	57,14	14,28	14,28	0,00	28,57	14,28	42,86
Age 31-40 total	58,33	41,67	41,67	33,33	58,33	58,33	41,67	41,67	33,33	25,00	16,67	8,33	8,33	16,67
21-30 /men	50,00	75,00	25,00	25,00	50,00	75,00	25,00	50,00	25,00	50,00	25,00	0,00	0,00	25,00
21-30 /women	62,50	37,50	50,00	37,50	62,50	50,00	50,00	37,50	37,50	25,00	12,50	12,50	12,50	12,50
Age 41-50 total	45,45	72,73	36,36	27,27	27,27	36,36	63,64	36,36	45,45	18,18	45,45	9,10	0,00	27,27
41-50 /men	25,00	50,00	25,00	25,00	50,00	25,00	75,00	25,00	75,00	50,00	50,00	25,00	0,00	0,00
41-50/ women	57,14	85,71	42,86	28,57	28,57	42,86	57,14	42,86	28,57	0,00	42,86	0,00	0,00	42,86
Age 51-60 total	66,67	33,33	33,33	33,33	50,00	58,33	25,00	50,00	50,00	33,33	16,67	8,33	8,33	41,67
51-60/men	60,00	40,00	20,00	40,00	40,00	40,00	20,00	60,00	80,00	40,00	20,00	20,00	0,00	40,00
51-60/women	71,43	28,57	42,86	28,57	57,14	71,43	28,57	42,86	28,57	28,57	14,28	0,00	14,28	42,86
Age 61-70 total	58,33	66,67	41,67	33,33	41,67	50,00	33,33	33,33	33,33	25,00	8,33	25,00	0,00	16,67
61-70/men	100,0	50,00	50,00	0,00	50,00	50,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
61-70/women	50,00	70,00	40,00	40,00	40,00	50,00	40,00	40,00	40,00	30,00	10,00	30,00	0,00	20,00
All age groups/total	57,89	63,16	35,09	33,33	43,86	50,88	36,84	43,86	35,09	29,82	17,54	14,03	7,02	26,31
All age groups/ men	50,00	61,11	27,78	27,78	38,89	50,00	27,78	44,44	44,44	50,00	22,22	11,11	5,55	16,67
All age groups/ women	61,54	64,10	38,46	35,90	46,15	51,28	41,02	43,59	30,77	20,51	15,38	15,38	7,69	30,77

The analysis of the data of Table 3 leads us to the conclusion that the teachers support the following theories of media education (in descending order):

- Development of the critical thinking (the main aim is to develop the critical thinking, personality's autonomy towards the media/media texts)- 63,16% (without significant gender differentiation, but with the dominance of younger generation of teachers);
- Aesthetic (the main goals are to develop the "good" aesthetic perception, taste, abilities for the efficient evaluation of the aesthetic quality of a media text, for understanding of media texts; propaganda of the masterpieces of media culture)- 57, 89% (there are about

- 11% more of women's voices here than men's);
- Ideological (the main aim is the development of the skills for political, ideological analysis of different aspects of media/media culture) – 50, 88%.
- Cultural Studies (the main aim is to develop the audiences' skills for the analysis of media texts in the broad cultural, and social context) – 43, 86%;
- Practical (the main goal is to teach the audience practical skills of operating media technology) – 43, 86%;
- Semiotic (the main aim is the development of the audiences' skills for perception, understanding and analysis of the media language) – 36, 84% (there are 14% more of female than male voices);
- Inoculatory/Protectionist (the main aim to protect the audience from the harmful affects of media) - 35, 09% (women's votes dominate by 11%);
- Development of the democratic thinking (the main goal is to prepare young people for living in the democratic society with the help of media/ media culture)- 35, 09% (there are 14% of men's voices, than women's);
- Satisfaction of the audience's needs- 33, 33% (the main aim is to satisfy the needs of the audience in the area of media/ media culture).

Herewith, teachers consider the following to be important: development of the skills for moral, psychological analysis of different aspects of media, media culture (26, 31%, the women's voices are twice as many as the men's); communicative abilities (29, 82%, men's voices are twice as many as the women's); skills to self expression through media, creation of media texts (17, 54%). Such objectives as the knowledge about the history of media/ media culture (14, 03) and theory of media and media culture (7, 02%) got the smallest rating, though in the latter case it is not quite clear how one can develop, for instance, critical thinking of the audience or teach about the media language without reliance on the theories of media.

Comparison of these data and the results of the questionnaire of the international expert group [Fedorov, 2003] shows that the opinions of Russian teachers are close to those of the experts' in many cases: the teachers (though the percentage is smaller) place the aim of the development of critical thinking on the top, as well as the experts (84, 61% of experts, 63, 16% of teachers). The difference in attitude towards aesthetic (57, 89% of the teachers, 46, 15% of the experts), ideological (50, 88% of the teachers, 38, 46% of the experts), practical (43, 86% of the teachers, 50% of the experts) and "consumerism" (33, 33% of the teachers, 30, 77% of the experts) objectives of media education is not crucial, as you can see from the figures above.

Yet the comparison with the experts' rating of the objectives reveals that Russian teachers tend to over estimate the role of "protectionist" (35, 09% of the teachers vs. 15, 38 % of the experts) objectives of media education, to the detriment of the semiotic and cultural studies aims, which got 57 to 70 % of the experts' votes.

Almost twice less rating was made by such a popular with the experts (61, 89%) category as the development of the critical thinking. The same is true for the communicative aim (57, 34% of the experts vs. only 29, 82% of the teachers) and for the development of the skills for self-expression through media (53, 85% of experts, 17, 54% of teachers).

The importance of the knowledge about the history and theory of media/ media culture turned out to be also underestimated by the teachers, compared to the expert group. There are 37 to 48% of supporters of these aspects among the experts, while only 7 to 14% among teachers.

All of this leads us to a conclusion that in spite of the general support given by the experts and the teachers to the priority of the development of critical thinking on the material of media culture, there is no sufficient understanding among the in-service Russian teachers of the importance of several other media educational objectives. For example, the potential of the media education lessons aimed at the development of the democratic thinking of the audience are clearly estimated too low, while the weight of the protectionist objectives is exaggerated.

So, the figures of Table 3 offer some idea of the “theoretical” background which influences the teacher’s work. However, we needed to find out, to what extent the teachers really implement elements of media education at their classes. The results of the answers are presented in Table 4.

Table 4. Teachers’ Use of Media Education Elements in Schools

Age/gender of teachers	Elements of media education are used during the lessons	No elements of media education are used during lessons	It is hard to answer this question
	Number of teachers (in %) who chose the answer		
Age 21-30 /total	70,00	0,00	30,00
21-30/men	100,00	0,00	0,00
21-30 /women	57,14	0,00	42,86
Age 31-40 /total	41,67	25,00	33,33
21-30/men	50,00	0,00	50,00
21-30 /women	37,50	37,50	25,00
Age 41-50/total	36,36	18,18	45,45
41-50/men	25,00	25,00	50,00
41-50 /women	42,86	14,28	42,86
Age 51-60 /total	25,00	33,33	41,67
51-60/men	60,00	20,00	20,00
51-60/women	0,00	42,86	57,14
Age 61-70 /total	8,33	25,00	50,00
61-70/men	0,00	0,00	100,00
61-70/women	10,00	30,00	60,00
All age groups/total	35,09	21,05	43,86
All age groups/men	50,00	11,11	38,89
All age groups/women	28,20	25,64	46,15

Let’s remind ourselves that the analysis of the figures of Table 2 showed that about 75% of the teachers think that media education of the schoolchildren is the essential component of the modern educational process. At the same time figures of Table 4 tell us that in reality only 35, 09% (50% of men and 28,2% of women with the majority under 51 years old) of the questioned teachers were confident to say that they use elements of media education during their lessons.

21, 05% of the teachers (11,11% of men and 25, 64% of women, the majority belongs to the elder generation) confess that they never use media education elements at their classes. The rest of the teachers are not sure what to answer. We can see the reason for that: the analysis of the following tables (Table 5, Table 6) reveals that about half of the teachers use media material during their lessons very seldom, because they feel that they lack knowledge about theory and methods of teaching media (the latter, to our mind, is another serious argument for the introduction of the new university-level Major- ‘Media Education’ in pedagogical

institutes).

Data about the frequency of media educational lessons, conducted by the teachers are presented in Table 5.

Table 5. Teachers Opinions about Frequency of Media Education Elements Occurred During their Lessons

Age/gender of teachers	Some elements of media education are used regularly	Media education elements are used occasionally	Media education elements are used seldom or never
	Number of teachers (in %) who chose the answer		
Age 21-30 /total	20,00	30,00	50,00
21-30/men	33,33	33,33	33,33
21-30 /women	14,28	28,57	57,14
Age 31-40 /total	16,67	33,33	50,00
21-30/men	0,00	50,00	50,00
21-30 /women	25,00	25,00	50,00
Age 41-50 /total	0,00	27,27	72,73
41-50/men	0,00	25,00	75,00
41-50 /women	0,00	28,57	71,43
Age 51-60 /total	8,33	25,00	66,67
51-60/men	20,00	20,00	60,00
51-60/women	0,00	28,57	71,43
Age 61-70 /total	0,00	25,00	75,00
61-70/men	0,00	100,00	0,00
61-70/women	0,00	10,00	90,00
All age groups /total	8,77	28,07	63,16
All age groups /men	11,11	38,89	50,00
All age groups /women	7,69	23,08	69,23

Figures presented in Table 5 suggest that only 8, 77% (the most active group within it are men teachers aged 21-30) of the teachers use elements of media education on a regular basis. 28, 07% of teachers integrate them from time to time (men are 15% more than women).

Noticeably, 63, 15% of the teachers (there are more women, especially elder ones, about 20% more than men) declared that they seldom if ever use media literacy activities in their lessons. Taking into consideration that 21, 05% of the teachers had previously said that they do not teach about media, this number goes down to 42, 1% of the questioned teachers.

Certainly, I was also interested to know what the hindrances on the way of media education at schools are.

Table 6. Reasons that Prevent Teachers from Integrating Media Education Elements During their Classes

Age/gender	Obstacles				
	I lack knowledge about theory and practice of teaching media education	I don't want to teach media	I don't have the financial motivation to do additional work	I am not familiar with media technology	I didn't get any directions and obligations from the school authorities
	Number of teachers (in %) who chose the answer				
Age 21-30 /total	30,00	0,00	40,00	10,00	70,00
21-30/men	00,00	0,00	0,00	33,33	100,00
21-30 /women	42,86	0,00	57,14	0,00	57,14
Age 31-40 /total	50,00	8,33	100,00	16,67	66,67
21-30/men	75,00	0,00	100,00	0,00	100,00
21-30 /women	37,50	12,50	100,00	25,00	50,00
Age 41-50/total	54,54	18,18	90,91	18,18	90,91
41-50/men	50,00	25,00	75,00	0,00	100,00
41-50 /women	57,14	14,28	100,00	28,57	85,71
Age 51-60 /total	83,33	8,33	91,67	25,00	100,00
51-60/men	80,00	0,00	80,00	0,00	100,00
51-60/women	85,71	14,28	100,00	42,86	100,00
Age 61-70 /total	50,00	33,33	66,67	50,00	58,33
61-70/men	50,00	50,00	100,00	0,00	100,00
61-70/women	50,00	30,00	60,00	60,00	50,00
All age groups/total	54,38	14,03	89,47	24,56	77,19
All age groups/men	55,55	11,11	72,22	5,55	100,00
All age groups/women	53,84	15,38	97,43	33,33	66,67

As we can see from the Table 6 the majority of teachers point to the lack of financial motivation as the biggest obstacle on their way (89, 47%, teachers over 30 mostly, women outnumber men by 25%). Then follow complains about the corresponding guidelines/directions from the school authorities (77, 19%, among them there is 35% more of the men teacher, aged 41-50). About half of the teachers (54, 38% aged above 30) realize that they lack knowledge about theory and practice of media education. 24, 56% of the teachers (only 5, 55% of men among them, 33,33% of elder women) consider the serious impediment is that they are not familiar with media technology. And only 14, 03% (teachers over 60 years old mostly) of teachers do not want to deal with the media during their classes. There is no one in the age group of 21-30 who expressed a hostile attitude to media education.

Hence, the most significant hindrance of the development of media education according to Russian teachers is the low salary, definitely not enough to become enthusiastic about new technologies and re-writing their usual syllabuses. Though further more we find out that another major problem is the lack of the initiative of the teachers, who do not venture upon the innovation without the directives from the authority. With that, the obstacle, not in the least less, is the insufficient media literacy of teachers themselves.

General Conclusions

The analysis of the conducted questionnaire among teachers of secondary schools showed that realizing the great importance of the media in the contemporary information society, three quarters of them support the idea of media education at schools and 58% believe that a new

major for pedagogical institutes needs to be introduced - "Media Education". Most of teachers justly think that the combination of the autonomous and integrated media lessons is the most effective way today for the development of media education in Russia, and therefore - for the increase of media literacy of the young generation.

However, in spite of the fact that majority of teachers define the aim to develop the critical thinking of the audience as one of the most important, they significantly overestimate the weight of "protectionist" approach to media studies today, and on the contrary, undervalue the goals to develop the democratic thinking of the pupils, their knowledge about theory and history of media and media culture.

Moreover, despite of the general support of media education ideas (in theory) expressed by 75% of the teachers, actually only one third of them use some elements of media education at their lessons (in reality), and one fifth of the group does not do anything about it.

The hardest obstacle on the way of media education into the Russian classrooms is the absence of financial motivation, according to the teachers, though to our point of view, last but not the least is the passive anticipation of the authority's directives and insufficient level of knowledge of today's Russian teachers in terms of the theory and methods of media education.

Thus, the analysis of the teachers' questionnaire has given us additional proof for the necessity of the official introduction of the new university-level Major- "Media Education" (namely, Major because the homonymous Minor was registered in 2002) and media education courses for the students of all pedagogical institutes. Only when the media literate graduates of universities come to work in schools, we will be able to evaluate the position of media education within the curriculum.

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Appendix

Questions on the topic “Attitude of the School Teachers to Media Education of Pupils and University Students” (the author of the questionnaire is Prof. Dr. A.Fedorov)

What is your attitude to media education?

1	There is no need in media education for pupils
2	Media education should become part of the school curriculum
3	Media education should be offered through electives, after school clubs
4	There is no need in media education for university level students
5	Media education should be mandatory in pedagogical institutes and universities
6	Media education should be elective in universities
7	It is necessary to introduce a new Major - “Media Education”, in order to prepare the qualified media teachers for secondary schools
8	Media education of pupils and students should be integrated into the traditional subjects (literature, history, biology, etc.)
9	Media education in school and university should be autonomous course
10	Media education in school and university should combine both forms, autonomous and integrated classes

What would you say are the main aims of media education?

(Check 5 most important for you)

1	Encouraging the development of the aesthetic taste, perception, evaluation of the aesthetic value of a media text, appreciation of masterpieces of media culture
2	Development of the critical thinking and critical autonomy of the personality towards media texts.
3	Protection from the harmful influences of media.
4	Satisfaction of different needs of the audiences
5	Teaching practical work with media technology
6	Development of the audiences’ skills for political, ideological analysis of different aspects of media.
7	Development of the skills of perception, understanding and analysis of media language.
8	Development of the audiences’ skills for the analysis of media texts in the broad cultural and social contexts.
9	Preparing young people for living in the democratic society.
10	Development of the communicative skills
11	Development of the ability for self-expression with the help of media technology, creation of media texts.
12	Teaching and learning the knowledge about the history of media, media culture
13	Transmittance of the knowledge about the theory of media, media culture
14	Development of the skills for the analysis of different aspects of media, media culture in terms of moral values, and psychology.

Do you use elements of media education during your lesson?

(choose one of the following)

1	Yes
2	No
3	Hard to say

If you use the elements of media education during your classes, then how often?

(choose of the following)

1	Regularly
2	Occasionally
3	Seldom or never

If you do not use media education elements, what prevents you from doing it?

(you can choose 1-3 variants among these)

1	I feel I need more knowledge about theory and methods of teaching media
2	I do not want to teach media
3	I do not feel financial motivation
4	I am not familiar with technology
5	There are no directives from school authorities
6	Other reason (what?)

Design And Communication For Local Development: Technological Decisions In Collaborative Scenarios

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Abstract

Design for development is an approach that tries to develop a new conceptual matrix in order to actively face the dissociation between technology and society. It is carried out at the **CAO Center** (Computer Aided Design Centre) of the University of Buenos Aires, sets in motion the experience of design, accompanying local communities in the unfolding of strategies of inhabitability linked to axes of local development: water and sanitation, territorial rooting, creation of satisfactory employment, reconstruction of the productive fabric, food safety, peace, accessibility of the vulnerable communities to the cultural circuits.

Our project¹ thinks the designer as an agent of technological change, who makes it possible to develop a technological-, product-, and communication-culture, starting with an animation device based on the web 2.0, which articulates, connects and/or communicates the requirements, needs and/or resources of the territory where it is located, with other social networks in other geographies. We present our theoretical and methodological frame. We describe some experiences of technological assistance and hosting, from the University to the civic initiatives regarding water and sanitation, satisfactory employment, and territorial

¹ <http://www.investigacionaccion.com.ar/site/>

rooting in isolated areas, geographically or socially speaking, in order to promote the technological and methodological contributions of small-scale solutions.

1. Presentation of our project: History

Our project RED² acknowledges its origin and expansion in the university's process of aperture towards the community, and took place parallel to the creation of the *CAO* (Computer Aided Design) Center.

The hypothesis behind this initiative was that the forming of a critical mass in research in the field of new technologies³ associated with a transfer device, created a new agenda for research in design. The projects for the transfer of the new technologies were like "windows to everyday life", serving as devices to unveil the behaviours of local communities, the obstacles for the appropriation of technologies, the ethics that guided their technological and design practices, performing intelligence and tendency tasks within the productive system.

Knowledge problems in technological transfer

When accepting the transfer experiences, the use of new technologies didn't have to be an objective in itself: we assumed that they, as well as design, are in the horizon of any productive unity or community, as a component of their practices. Our task was to find groups, communities and ventures that were traveling this process. The notion of "accompaniment" and "animator" is considered an essential component to this proposition, as an ideological taking stance: we assist in self-management processes, which are generators of autonomy that transforms communities in subjects of development in their territory, and in front of their peers. We consider quality of life as the objective of any experience of technological transfer, and originating in an academic environment we have contextualized the reflection and systematization of the series of problems of endogenous development. These considerations about technology transfer, in peripheral contexts, are based on the accumulated historical experience of technological frustrations due to an assimilation which was incomplete and not very intelligent. We suggest the "appropriation" as the process through which a community develops a proactive relationship between technology and its own objectives. We promote the change of the communication paradigm in Internet towards the generation of local contents in a global scenario.

We consider that "strategic innovation" are those acts of technological creativity, oriented towards the adaptation and adoption of technologies, in relation to objectives of local community development. It is a creativity which is not valued in the field of innovation, but necessary in order to "metabolize" technologies by means of an intelligent learning. Local initiatives, the projects, operate as devices for the restitution of the "social" character of technology as an adjustment factor between aspirations and resources.

This criterion of technological transfer based on projects contradicts the policies of the "top/down" type, which consist of extending the networks, granting credits, and making infrastructures grow, without animating the flow paths in the system, nor promoting local development. Technological animation tends to close this gap. The theoretical premises were

technological change as scenario,
participative research action and communitarian construction as methodologies,
endogenous development as objective,
the designer as the cultural animator
product culture as the structuring axis of social fabric

² *Interfase entre el Diseño y la Comunidad* (Interface Between Design and Community), 1990.
Creación Asistida por Ordenador (Computer Aided Creation), en 1990.

and territory as a complex system

New technologies have to be animated so that they generate other behaviour patterns, new social and institutional dynamics, and we believe that the designer is a natural agent of technological change. Design is like the “Trojan Horse”, which carries the germ of the TICs and their social and productive dynamics into the core of the communities and the productive units. Our research project⁴ *Diseño y Comunicación para el Desarrollo Local*⁵, in which we understand territory as a complex system emerging from the result of actions and interactions of individuals and/or groups of individuals, some within institutions, official organisms, non-governmental organizations, in which *local knowledge* is vital. In our proposition, the experience of socialization of the knowledge at the territory is the research unit, which repositions and redefines technique within the context of sustainable local development, favouring its being appropriated by the emerging communities⁶.

Authors like Antonio Vázquez Barquero⁷ pointed out that the *technological progress presents an endogenous behaviour motivated by the effects that it generates on it, the generation of a better understanding of facts and learning.*

We believe that development goes beyond economic competitiveness, which drives to the destruction of the richness of the socio-cultural weave of a location; we promote development that takes human, social values, such as solidarity, cooperativism, responsibility in the local culture, and generator of citizen conscience.

2. The role of local context.

During the 70's, Argentina witnessed the collapse of the models of imports substitution that had animated the development of its national industry; like other countries in Latin America, it did not possess a project of productive development of an endogenous character. Later, the productive system endured the consequences of the neo-liberal policies of the 90's, which dismantled it almost completely.

In 2001, after almost 20 years of stagnation of the productive system, the destruction of virtuous networks and the disintegration of the social weave, the crisis of the financial system ensued. The abandonment of the convertibility again generated the conditions for an economic reactivation, with the growth of certain dynamic activities. But a large percent of the population was left out of the employment market, unable to comprehend the new productive dynamics, and living under the shelter of State subsidies.

The most significant objective of our project became the reconstruction of the productive fabric, which in turn is part of the social weave of a place. In this direction, we have detected different factors, institutions or productive initiatives, which are linked to social groups:

- Survival initiatives, related to a family group or a group of families with each other.
- Initiative of community action strategies, by means of the associativism in the area of social economy, based on territory on a “neighbourhood” scale.

⁴ <http://www.investigacionaccion.com.ar/site/>

⁵ *Diseño y Comunicación para el Desarrollo* (Design and Communication for Development), Project credited in the Program for Local Development of the *Secretaría de Políticas Universitarias, Ministerio de Educación, Ciencia y Tecnología* (Ministry of Education, Science and Technology), Program 2006-2007.

⁶ GALAN, B., MAIDANA LEGAL, A., SENAR, P. NEUMAN, M., *Diseño para el desarrollo: un enfoque en expansión*, (Design for development: an expanding approach) 2006, X Congreso Iberoamericano de gráfica Digital, SIGRADI; 2006, Santiago de Chile.

⁷ Antonio Vázquez Barquero, Oscar Madoery (compiladores) “Transformaciones globales, instituciones y políticas de desarrollo local” ISBN 950-808-326-3

- Initiatives that deal with culture and recovery or possession of civil values which range from the demand of housing improvements, to the recovery of cultural values.
- Initiatives of NGOs that work in the local area and are scattered in each other's knowledge of actions, very frequently overlapping actions.

These initiatives that are actions taken by subjects and institutions were exhausted on a neighbourhood scale. That is why one of its boundaries was its area of influence. Therefore, by means of technological support we managed to connect and place these actions with the activities on dynamic local or regional scales, reducing the digital gap, and starting the reconstruction of the social subject based on the expansion of productive culture. That is, contribute to the formation of social capital, through the reconstruction of the productive weave, as a social property belonging to local communities, that articulates technological resources in order to improve the chances for the integration to new scenarios and global dynamics, but with the logic of a local community.

Relationship between productive unit and territory: the innovation system

In the society of knowledge, in which inputs are not hard technological knowledge, but information and the capability to share, understand and take position in front of other cognitive, symbolic and cultural system, design acquires vital importance for local communities. But design must be reconsidered as innovation. This notion stresses the collaborative and synergic environment of the elements, unlike the design by author, which has no validity beyond the restricted circuits of the elite culture.

The endogenous growth takes impulse on a scenario where the knowledge accumulation variable is the determining factor of progress, associating design with knowledge, the basic characteristic of this contribution is not to consider technical progress as a factor that is determined in an exogenous manner, and accumulation as generation, organization, and socialization of knowledge. That is why, the larger the level of human knowledge accumulated and socialized, the quicker the development; therefore, productive growth will always tend to be faster, making an impact on the local social weave. That is why we have to tend to these situations:

- to have a large magnitude of the population educated and sensitized in technological issues, and
- an economic-productive environment that is favourable for the generation of human knowledge.

The movement established on the territory has two directions: one, which transmits knowledge and transforming energy from the productive unit to the territory (bottom-up), generating a productive atmosphere, and another one that tends to transmit the dynamics of the territorial institutional system to the productive units (top-down).

It is during the development and maturing of the productive units in which isolation is broken, and local scale is overcome. The representation of territory is altered, since the networks of resources-inputs-opportunities-threats, are on diverse scales. It is at this cross point, between local and contextual, in which globalization is consummated: that is, the individual incorporates the context and its threats, together with its resources and assets, and accesses a complex interpretation over which alternatives can be imagined, trajectories can be outlined, and strategies can be defined. Product management generally forces to have several scales that are systemically related by means of a double movement, bottom-up and top-down: at a scale of the productive unit, of local, regional and global contexts.

*Design management is the reorganization of resources, whether material or symbolical, in order to improve the positioning of a group, community, or company, in order to improve their performance in a productive and social context*⁸.

This social capital, as Fukuyama⁹ defines, is “the capacity that arises from the predominance of trust in a society or in determined sectors or actors. It may be personified in the smallest and most basic group of society, the family, as well as in the largest group of all, the nation, and in all its intermediate groups, among them, the productive units”.

Communitarian construction: design and cultural democracy

On the globalization scenarios, the productive units, the organization of civil society and the communities are forced to confront their possibilities and resources, to reorganize their material or symbolical patrimonies, in order to face transcultural and complex contexts. Strategic management of design is a structural coupling¹⁰ between a local reality, which is the object of management, and an external context, represented by the scenarios of globalization in which it is necessary to credit the local assets. From this line of investigation, we have developed a network as a device for the animation of transfer experiences¹¹, which provides a relevant empirical basis to support a process of reflection about the voids and limitations generated by the policies of productive development designed “from above”¹².

The approach to communitarian construction

The approach to communitarian construction is based on the concept of social capital, but it imposes a participative construction on the community’s side, which implies a task of overcoming the dependence on subsidies: self-esteem, generation of feelings of community, and becoming aware of the individual and collective assets of the neighbourhood. There are various methodologies under certain common patterns¹³: it is an oriented approach, the assets (not the shortcomings) support the reconstruction of social relations and structures, weakened by decades of migrations, uprooting, disinvestment and isolation. It promotes the formation of local leadership. It considers poverty as a complex weave of factors, a net of intertwined

⁸ SIMON, H., *Las ciencias de lo artificial*, translate by Francisco Girondella, Original Title: *The Science of the Artificial*, The Massachusetts Institute of Technology, Editorial ATE, 1978.

⁹ Fukuyama, F., "Las reglas del juego", *La gran ruptura*, Editorial Atlantida, 1999; Fukuyama, F., "Social capital and civil society".

¹⁰ D. I. Beatriz Galán, *Diseño estratégico y autogestión asistida en Buenos Aires: casos y cuestiones teóricas*, en *Universidad y Comunidad* (Strategic design and self-management in Buenos Aires: cases and theoretical issues, in University and Community), *Primer Congreso de Transferencia de Diseño: Diseño y Territorio*, (First Congress on design Transfer: Design and Territory) Universidad Nacional de Colombia, Bogotá, May 2006.

¹¹ *Formación de una red de transferencia de diseño, como dispositivo de animación, fortalecimiento y prospectiva del sistema de innovación*, (Construction of a network of design transfer, as a device for the animation, strengthening and prospective of the innovation system) *Programación Científica UBACyT*, (UBACyT Scientific Programming) 2004-2007.

¹² BOSCHERINI, F., POMA, L., *Mas allá de los distritos industriales: el nuevo concepto de territorio en el marco de la economía local*, (Beyond the industrial districts: the new concept of territory within the frame of local economy) in *El rol de las instituciones en el espacio global* (The role of institutions in global space), BOSCHERINI, F., POMA, L., compilers, Universidad de General Sarmiento, Buenos Aires- Madrid, Miño y Dávila Editores, 2000, (pp. 23-38).

¹³ Jorge, E. E., Censi, F., Bertuchi, J., *Capital Social y pobreza : casos y métodos en la “Construcción comunitaria”* (Social Capital and Poverty: cases and methods in “Communitarian Construction”), www.cambiocultural.com

problems, pertaining to health, to environment, to employment, and it is necessary to untie the knot of the problem. Part of that problem is ignorance regarding the productive dynamics and the restrictions to the narrow boundaries of locality. The approach of “communitarian construction” is based on the following principles:

- To be focused on specific initiatives.
- To be conducted by the community with a broad participation criterion.
- To have an entrepreneur-communitarian approach.
- To rest on the assets of the community
- To set out from the local scale, towards society. To link local scale with the territory.
- To attack with a strategic vision, conscious of the barriers that create exclusion.

The role of design

The valorization and organization of the resources, competences and beliefs, even of the resilient attitudes¹⁴, of each community lead to a project-program that implicates the unfolding of activities. These involve means which get defined within the framework of communication and product policies. Seen in this perspective, as mediators of interactions, products or interfaces must comply with patterns of cognitive and symbolical as well as technical and economic¹⁵ performance. This process suggests to us a rereading of the contribution of design, bringing in specific resources:

- By means of productive mappings and social cartography¹⁶, it contributes visibility to the territory networks, which intertwine resources and opportunities.
- Through elements of communication it enables consensus.
- As a systematizer of visual systems, expressing local identities, it is an agent of institutionality.
- As a systematizer of the offer of local products, articulating them into the dynamics of demand, it helps mature the chains of value.
- By granting visibility to the innovation networks, it is an agent of understanding and appropriation of territory, of its structure, of its possibilities, contributing to the construction of social capital.
- By means of the addition of new technologies in social practices, it transforms local communities in producers of contents, subjects of information society, and agents of development, on a broader geographical scale.

¹⁴ TOSCANO, S., Spinadel, V. W de, (supervision), *Utilización de los parámetros de resiliencia de la planificación del desarrollo local*, (Using resilience parameters of local development planning) lecture at the *Jornadas de Investigación de Diseño para el Desarrollo Local* (Research Conferences on Design for Local Development), 2006, Buenos Aires, Facultad de Arquitectura, Diseño y Urbanismo, Universidad de Buenos Aires, <http://www.dide.investigacionaccion.com.ar>. The author considers poverty as the main factor of contamination, and relates the success of development projects to their implementing resilience, considered as the “capacity of an individual to react and recover in the face of adversity, which implies a set of qualities that promote a process of successful adaptation and transformation in spite of the risks and misfortune”.

¹⁵ Galán, B., Orsi, L., *Diseño para la gestión ambiental: decisiones tecnológicas en escenarios participativos* (Design for environmental management: technological decisions in participative scenarios), in the Acts of the *IX Seminario Iberoamericano de Gráfica Digital* (IX Iberoamerican Seminar on Digital Graphics), 2005, Lima, Perú.

¹⁶ NEUMAN, M, ORSI, L., GALAN B. , *La cartografía social como elemento de mediación para el desarrollo territorial*, (Social cartography as an element of mediation for territorial development) in the *Jornadas de Diseño para el Desarrollo Local* (Conferences of Design for Local Development), FADU, UBA, 2006. <http://www.dide.investigacionaccion.com.ar>.

New technologies in Argentina: Some indicators

According to the annual ranking prepared by the World Economic Forum, the nation went from the 71st place to the 63rd place, in the period 2006/07, most of the countries in Latin America showed an improvement in the use of the information technologies in the last year. This study, developed by the Forum in collaboration with the International Business School INSEAD, bases its conclusions on the application and the use of the information technologies as one of the factors that are taken into consideration in order to determine a country's competitiveness. Among other factors, we find regulatory frameworks; infrastructures; preparation of citizens, governments and firms to take advantage of the resources and their real use of cutting-edge technology.

Another factor is the amount of accesses to Internet, specially broadband. Around 1.583.713 connections to Internet through broadband were registered in Argentina by the end of 2006, showing an annual growth of 66.2% in high-speed connections, as shows the third edition of the Cisco Broadband Barometer.

Based on the analysis performed by the Cisco Broadband Barometer, the main results were:

- In the second semester of 2006, the Home segment experienced a 31% increase and the Business segment, an increase of 17.7%. According to data from the INDEC of 2005, there are in Argentina 10.07 million homes. If we considered the current amount of broadband technology connections in the Home segment, 1.58 millions, we can conclude that only about 15.7% of these homes have an Internet connection with Broadband technology.
- A fact to take into consideration in the numbers recently surveyed is the growth in the broadband connections in the Education segment, which reached almost 29%. During the June/December semester, the total penetration in the Education area was of 14.7%. In this period, the increase occurred mainly by individual initiatives of the educational units in the country.
- The ADSL access technology grew 76% during the last year, which makes it the type of connection with the highest increase, followed by Cable Modem connections, with 49% increase.
- Dedicated Lines increased 24.4% during the last semester, mainly in the segment of small and medium sized businesses. As far as satellite technology is concerned, it grew 12.7% during that same period mainly in the segments of Government and Education.
- In the Metropolitan Area of Buenos Aires, connections increased 23.4% between June and December 2006. Outside this area, connections increased 57.4% during the same period.
- Although the Optical Fiber Corridor - formed by the City of Buenos Aires, the provinces of Buenos Aires, Córdoba, Santa Fé and Mendoza - keeps concentrating 90% of the connections, a higher increase begins to be noticed in the tourist and productive areas of the country, outside the Metropolitan area.

Tics and social inclusion

An urban strategy for technological inclusion must turn to the “bottom-up” model, Castells¹⁷ points out that “Disconnected areas are discontinuous culturally and spatially” it must have a combination of political strategies and social software, we could mention the following:

- Promote web 2.0 in which citizens and politicians take part.
- Open access to Internet: generalized and inexpensive telecommunication networks.
- Broad and diverse basis of knowledge.

¹⁷ " La Sociedad Red (The Rise of Network Society), La Era de la Información, Volúmen 1, 1996. Alianza

- Use of open and flexible licenses for the knowledge and the “cultural products” (ranging from Copyleft to Creative Commons), which favour reusing and recombining software.

Challenges for Internet on a territorial scale are the hyper-local networks where the power of digital networks and physical networks come together, what is local and what is global. We believe that Internet+Tic are an innovative means that relate to local development and animate the system of social, productive, institutional, economic and territorial structures, creating the conditions for a generation of synergies, and these move the production processes that originate in these synergic capabilities, both for the production units that are part of these innovative means, and for the community as a whole. We no longer think in economic equations, nor do we reinvent concepts about development, instead, we must tend to achieve a balance between sustainable social growth and the development of human capital.

3. The construction of cases:

Experience 1: Design and technology for the generation of environmental citizenship. New technologies and their role in the formation of social capital.

Experience: El Riachuelo Foundation¹⁸

Current situation:

The work of the foundation The Riachuelo, has been developed more than for 20 years in Villa Jardin, this area this located on the one he/she laughed Slaughter- Riachuelo, in the conurbano from Buenos Aires. It is located on a margin of the one he/she laughed Slaughter. Riachuelo and this, plow the polluted in Latin America. The foundation achievement with success to implement in the area a strategy to spread the nets of drinkable water until the neighborhood, with a methodology that he/she goes from the individualization from each family group to the pursuit of the contractors. This working methodology that was socialized, to other entities mires, by means of visits and consultantships that were materialized in meetings and discussions on the application to the case in short. Let us remember that the alone conurbano from Buenos Aires has 67% of its inhabitants drinkable water¹⁹ and 40% sewers *, in the same one they inhabit 8.600.000²⁰ of people.

Objectives

In the area, Villa Jardin, the index of people's informatización is very low, but this contrasts, with the will of giving to know its experience, this will is observed in people that have lived and they have participated of the same one. their population would originate, you/he/she continues living and the place, achieving that there are already two and up to three generations living in the neighborhood and until in the same lot. It is characteristic it facilitated that, the adults, relate to the smallest envelope like it was the neighborhood before there were drinkable water and the same one they were summoned by neighbors of other neighborhoods to collaborate with their experience, to other projects to be carried out or in march.

¹⁸ <http://www.investigacionaccion.com.ar/fr>

¹⁹ http://www.metropolitana.org.ar/publicaciones/lgc_05.htm

²⁰ Fuente: INDEC, Censo Nacional de Población, Hogares y Viviendas 2001.

- Development of a repository for citizen initiatives regarding water strategies + sanitation in Internet.
- Development and transfer of an informatics system for the maintenance of the repository by the dwellers.
- To promote the use of informatics as a tool of communication.

Series of problems that were detected

In the area, *Villa Jardín*, the rate of informatization is very low, but this stands in contrast to their will of making their experience known to others. The original population still lives there, reaching already two and even three generations living in the neighbourhood, and on the same plot of land. This feature enabled the elders to narrate to the younger ones what the neighbourhood looked like before potable water became available; they were invited in by the dwellers of other neighbourhoods to collaborate with their experience to other projects which would be carried out, or were already under way. The following were points taken into consideration at the moment of designing an information system for the Foundation.

- Ease of maintenance and updating.
- That it possessed the possibility of incorporating young people as well as older adults to the informatics work.

The solution that was put into practice

We worked with the concept of webpage, taking its graphic interface and array of elements. We reduced texts to a minimum, and we introduced sound as an element of communication. Sound was presented by means of narrations of experiences, in the voice of those who had taken part in them, thus managing to make the site appropriate, as an element in which each one would portray how introducing potable water to their homes had affected things. We took resources from social cartography in order to identify in the territory zone-milestones, and these could be presented by the dwellers themselves.

The item of maintenance and updating was solved by means of the web 2.0. All the steps that will be described were carried out with free, open source software. A graphic piece, as quality seal (Figure 1) was proposed to the Foundation; with it other entities would be invited in to discuss, reach consensus and write down the norms that would rule the publishing of experiences or projects into the repository. We worked on a neighbourhood brand, where we developed an experience so that dwellers may have an image of the neighbourhood that will nourish their sense of belonging both to the neighbourhood as to the rest of the city (Figure 1).

Final comments:

- The decision to make use of voice in the narrations has also got a symbolical connotation; the fact of passing on the word or the voice to those that are directly affected by the problems in development, allowing them to take part directly in the spreading of the experiences
- We acknowledge that reality is mainly a social construction. We draw from that that it deals with longer times, and many hands that shape it. It is there where the designer takes the role of the agent of change and group cohesion from which new actions to be carried out can be born, according to their perceptions and their needs.
- The idea of a quality seal was not to “impose” an image, but rather, that it would favour dialogues with the entity that were so far unknown.

- There is no adequate universal informatics formula for each situation presented, and therefore the production, putting into practice and/or design of the software has to be appropriate for the cultural, social and economic context in which it performs.
- And lastly, we understand that people and processes are necessary to enable the transmission of knowledge with the objective that the latter may produce positive results. In that sense, the means of communication and technology are means and not an end in themselves.

Experience 2 : Moreno: Pre-feasibility of a fair of neighbourhood productive units.

It is a project on a neighbourhood scale²¹, the objective of which is to identify, mobilize and articulate the competences and resources of the neighbourhoods *Santa Elena*, *Satellite II* and *Evita Obrera*, attempting²² to reconstruct the productive weave. The local context is lead by activist civil societies of three soup-kitchens, with whom some working bonds had already been established based on the presence of a local group of PROMEBA²³. The project explored and proposed to mobilize the competences of these soup-kitchens in the gastronomical area, which had surged from their need to face the food necessities of the child population. The initial objective was to study the feasibility of a fair that would settle in an ad-hoc space projected by the PROMEBA.

Moreno specially revealed the advantages of the neighborhood, its adequate scale as a first link to the territory, to detect and incubate productive units. This supposes to step from the domestic or communitarian productions onto productions from productive units of social economy. It also showed the limitations of this neighbourhood scale for this purpose, since the market is located in a context that is external to the neighbourhood itself, and the resources and dynamics of which the dwellers ignore. The gap between domestic productions and micro-businesses of social economy leads to the necessity to reproduce in some way a device of “incubation”, inserted into their local practices. The profile of the productive units in the gastronomical area surged from a double outlook on the neighbourhood competences and over local opportunities, since the IMDEL promotes a gastronomical corridor in the city council.

Parallel to that, we attempt to introduce knowledge of new technologies, in order to promote, through the web, the incorporation of resources in a scale other than the one of their neighbourhood and access to the market.

This experience will try to go deeper into the concept of incubation, inserted into the communitarian practices and strategies, using the resources of the local institutional system. In order to accompany these productive initiatives, the support of TICs is vital, since the market for their development is in the centre of the city. The articulation in the web would enable to win clients in a larger area, more distant, with a higher purchasing power, while doing without the own elaboration installations. Since the productive units are small, and their chances of investment are nil, they should share the installations for food elaboration, available on a local scale, by agreements with local communitarian institutions. This project and others took us to value the role of the intermediate associations as devices for the incubation-maturing of productive units the final insertion of which will be the private economy, but which for a long period lack the capital and the knowledge that are necessary for their full autonomy.

²¹ NEUMAN, M., RUFINO, J. P., *Animación territorial de emprendedores para la organización de una preferia barrial*, (Territorial animation of entrepreneurs for the organization of a neighbourhood pre-fair), lecture at the *Jornadas de Comunicación para el Desarrollo Local*, (Conferences of Communication for Local development) FADU, UBA, 2006.

²² Neighbourhoods located in the district of Moreno, Province of Buenos Aires.

²³ Programa Mejoramiento de Barrios (Program for the Improvement of Neighbourhoods), National Ministry of Infrastructure. The Program developed an urbanization project under a participative and interdisciplinary methodology.

Experience 3 : Productive transformations in the Delta of the Paraná.

Delta of the Paraná is the name given to an area of territory in the final portion of the Paraná River system, with an overall surface of 17,500 km². It is the second in importance in South America, after the *Amazonas* one (Bonetto, 1986). It spans from the city of *Diamante* (province of Entre Ríos) to the mouth of the rivers *Paraná* and *Uruguay* in the estuary of the *Río de la Plata*. In the year 2000 it was declared World Biosphere Reserve, promoted by Argentina at the UNESCO, with the aim of protecting the natural riches of the area, and of stimulating economic activities with a sustainable ecological profile. The first section of the islands -an area strongly dominated by agricultural activities in older times- is nowadays an area where tourist and sports activities concentrate. The 2nd, 3rd and 4th Sections are still areas of a predominant primary productive activity, where forestation of salicaceae, for paper, constitutes to date almost a mono-production, although there are also producers with wicker plantations for handcrafted products, and a growing cattle farming activity in large producers. The change in activity determined that many of those who had been small fruit producers had to abandon the Delta or turn to working as employees, since forestation began to demand a substantially larger economic unit. Those who could not have access to new land lost their quality of independent producers, and had to migrate to the City, proceeding to become a part of the labour circuit linked to the recreational activities, or of the unemployed sectors.

Manos del Delta (Hands of the Delta).

Hands of the Delta is an artisans' cooperative that congregates 21 family micro-businesses in the area of the Tigre district, who work in the production and commercialization of objects manufactured in rush, wicker and willow. All its members were born on the islands located between the second and the third sections of the Delta of the Paraná.

Each family of artisans manufactures original products based on raw materials that they grow in their homes and fields, and which are transformed in their workshops, using their own production techniques. They know technologies and possess basic tools for this transformation. In order to commercialize these products, this organization has a location at the *Puerto de Frutos del Tigre* -a commercial space of great diffusion in the area of the Autonomous City of Buenos Aires and the Province of Buenos Aires-, which was assigned by the local city council in 1996.

The active policies for the reconversion of areas of the population of the Delta, from the production of fruit and vegetables, to the production and transformation of wicker and its byproducts into products, remarkably broadened the capacity of sustainability of the families and small and micro productive projects with a behaviour that is respectful towards the natural and social resources of the region. *Manos del Delta* was established as a cooperative in 1996. As an intermediate organization it has since covered the role of link between the delta population and the markets, contributing to the sustainability at each productive enclave.

The rol of new technologies.

Online cataloguing²⁴ of the complex offer of products, which was developed in our projects, enabled access to the national market, allowing the response to orders coming in from different parts of our broad country. This gave the Cooperative projection, and positioned it as a productive referent of the region, preserving its lifestyle and territorial rooting. It is

²⁴ <http://www.manosdeldelta.com.ar/catalogo.htm>

necessary to remark that the sales-point works in the continent only, for three days a week. The web site is seen to by a member who was trained in the modification of prices, and this generates a permanent technical assistance of our project. The habitat of the artisans' lacks layouts of optical fiber networks, and broadband is still inexistent. An intermediate Development Agency *Arroyo Felicaria*, will soon introduce broadband by means of an agreement with Microsoft, and this will enable the incorporation to our Conferences of sensitization web2.

Experience 4. Sensitization about web 2.0 technologies.²⁵

The interactions and transmission of knowledge are vital for the construction of a space of communication in which individuals establish relationships, share their experiences, learn their practices collectively and give them sense. This space, constructed materially, symbolically and as an experience, is what we call “**Workshop in the Sensitization of Web 2.0 Technologies**”. In these workshops we develop and test methods, processes, systems, procedures, digital artifacts, that is, technologies, aimed at increasing the capabilities to produce value in people and in organizations, based on inclusive outlooks of the technology, and towards a technological democracy.

In very schematic terms, the technology we gradually develop and apply is supported on the following items: To simultaneously achieve productivity and quality of life, and capacity to undertake and innovate locally; we encourage the capacity of people to individually -but socially responsibly- take charge of a self-generated design which holds values belonging to the individual and to his community. Figure N^a2

The capability of an organization of people, which we will call Social Capital²⁶, will be dependant on:

- The capability to produce value in the individuals that are part of it, Human Capital.
- The capabilities of individuals to cooperate among each other, Relational Capital.
- The environmental conditions in which the individuals act and relate to each other. Environment.
- The lining up of the people in these organizations with a common purpose, which is debated in this environment. Objectives.

4. Prospective:

Access to web 2 enables the productive initiatives in isolated areas, with different types of exclusion and isolation, to reach distant markets and to win resources that are available in the web. Intermediate associations are naturally the organizations that allow an approach to web 2 technology.

It is possible to scale a management model, which would combine an incubator with accessibility to web 2, based on intermediate entities that act as incubators of local initiatives. We believe that this would be a powerful device against exclusion.

This lead us to establish a procedure systematic, consisting of a hosting service and technical assistance to communitarian initiatives, which is administered by means of local associations, complementing the projects and actions of animation of the communitarian action strategies. The proposal values and strengthens intermediate entities, as devices for the incubation-maturing of communitarian undertakings. The idea of the incubator implies that the technical

²⁵ <http://www.investigacionaccion.com.ar/jornadas>

²⁶ JEROEN, H., ICTs Quality of life and social capital, in the Field of Scientific an Technical Research (COST) ICT Capabilities en action, 2004.

assistance should tend to be limited in time, that the initiatives take off and become autonomous, generate their own resources of hard and soft. This takes us to additionally define a policy for the domain that ensures the ethic-environmental guidelines of the University of Buenos Aires.

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Figure 1



Figure 2



Teenagers On The Net : Generational Divide, Autonomy, Liberty, and Responsibility

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Abstract

This paper is based on recent qualitative observations made within the framework of the research project **TIRO -Teens and ICT, Risks and Opportunities**¹- sponsored by the Belgian Science Policy Office (BELSPO). The main topic of this research regards the rules and regulations shaped and used by teenagers (12 to 18) to guide their practices and their attitudes in the Internet sphere. In a first part, the paper questions the generational divide that shapes the teenagers' ICT practices and its impact on the youth's socialization and regulation. Based on these sociological and cultural observations, the second part analyses the traditional legal frame that should regulate this teenager's sphere, and questions its appropriateness.

Introduction

This article is based on recent observations made within the framework of the research project **TIRO -Teens and ICT, Risks and Opportunities**²- financed through the Belgian Science Policy Office (BELSPO). Observations, made over two years of virtual communicative practices with young people on the Internet, particularly the activity of blogging³, are also taken into account.

TIRO research has begun more than a year ago. This project is focused on ICT uses (Internet, video games and mobiles) by the 12-18 old teenagers. The central objective of this project is to **understand the social praxis around ICT use shaped by young people**, to question them concerning the risks and opportunities for their socialization. One of the political issues of TIRO is **the implementation of regulatory tools concerning risky activities well representatives of their reality** and to elaborate these tools via detailed observations of young people's common practices. TIRO research has a multi-disciplinary approach : sociologists, researchers from the communication sciences and legal experts work together to better understand the practices of teenagers in order to elaborate appropriate regulation. The methodology is multipolar with a quantitative survey⁴ and several qualitative approaches⁵

¹ Cfr the website <http://www.ua.ac.be/tiro>

² Cfr the website <http://www.ua.ac.be/tiro>

³In the context of a particular study (cfr *Je blogue, tu blogues, nous bloguons*, Clémi, France, http://www.clemi.org/medias_scolaires/blogs/article_blog_ACO.pdf) and certain projects in education concerning the media (BlogoMag, the magazine of blogging edited by *and* for young people, ACMJ).

⁴Survey made by Professor M. WALRAVE and Sunna LENAERTS, University of Antwerp, partner of the project. This survey is based sample of 1300 teenagers.

⁵ The qualitative phase includes 8 focus groups of boys and girls classified by age, gender and teaching background and a diary research made on a panel of 20 teenagers.

which complete each other: the quantitative survey has a large scale but is based on declarative datas⁶ decontextualized, without subjective meaning. On the other and, interviews, focus groups and blog tracking are contextualized and give detailed and comprehensive description of these practices. The particularity of this research is that it is not only a research on young people but with young people, that requires a high degree of participation and cooperation from young people themselves.

From this fairly large research framework, we have decided to narrow the focus in this article on the generational divide observed in our preliminary observations.

The generational divide is not new but seems to widen and harden with ICT use by young people. The adolescents of the 21st century occupy the space offered by these new media. They express themselves, they chat, consume, play, surf, read, listen... This new social scene seems to be entirely shaped by teenagers outside the world of the adults. Rare are the parents who manage to enter in these « new spaces » developed by their children. First, we will study the generational divide as it has been observed in our empirical work. Then, we will contextualize this generational divide with some sociological elements. We will take up the example of weblogs or “blogs” which illustrates on the one hand, the individualization of web practices of youths and their autonomy and on the other hand, the frantic search for the peers approval. Finally we will examine the impact on the socialization of young people of this increased autonomy or of this generational divide.

After those first observations, we will turn to the law in order to ask questions regarding the legal situation of ICT teenagers’ practices. The increasing autonomy of young people has poked breaches in their legal incapacity. These breaches are founded on their supposed capacity discernment. Thanks to new technologies, young people have access to the sphere of public expression and find themselves practically on the same footing as the press. Are young people, within the framework of this enormous power, well served by self-regulation pure and simple? Is their freedom of expression as wide in this regard as the one of journalists? After having examined these questions we will consider the limits of freedom of expression, based on the principle of respect for the rights of others. Two limits appear to us to illustrate questions in the context of a confrontation between adolescents and the new trends in freedom of expression, concerning cyberteasing and copyright. Here freedom shows its hidden face: liability. Adolescents are by definition in a legal state of incapacity. Does this also mean they don’t bear any liability? The underlying goal of the civil liability system is one of compensation of the damage suffered by the victim. What is the status of this liability as regards minors, their parents, and teachers, and does the current system of liability measure up to the underlying goal? Would civil liability be clarified and made more workable if it were detached from the notion of guilt, which in any doesn’t benefit the cause of the victim? With regard to each of these themes, we will discuss pathways for reflection concerning regulations and we will underline the fact that when someone’s rights are violated over the Internet, a right of reply offers perhaps an avenue of redress more adequate than litigious procedures.

The tone of this article is still quite exploratory, sign of a research project that is still in progress and which has taken up a fairly radical position to work with young people toward understanding and regulating their practices.

⁶Young people have great difficulties to write their practices or to describe gestures that seem spontaneous to them. They have a “procedural memory” (T. De SMEDT, A. KLEIN & L. ROMAIN, 2002).

The Internet, a catalyser of the generational divide

The generational divide shaped by ICT use has until now received **little interest in the sociological literature, even** in sociology of family⁷. Nevertheless, ICT use by teenagers reveals deep logics that mark currently the family structure. The French studies which have analyzed youth ICT practices, put little accent on the generational divide, rather on two principal topics: identity and sociability constructed through these practises. This focus on this twofold theme can be explained by the fact that adolescence has been for a long time defined by psychologists by its identitary characteristics (an age of mutations, construction of self) and its intense and particular sociability (peer pressure, conformism). The sociology of youth is recently appeared and the adolescence⁸ begins to be considered like a social category in relation to others (VIENNE & DELFORGE, 2006).

It is striking to see that Internet use by youths clearly fits into a perspective of the *among-ourselves* (in french: *entre-soi*), tribal and without adults (TREDAN, 2004 & METTON, 2004 & MARTIN, 2004 & Médiappro, 2006). Studies agree on this point but few worry about it. Concretely, we observe that the adult or the parental figure is absent in youth Internet use. **The Internet is learned alone, « is experienced » among peers, without recourse to adult.** Teenagers, especially the boys, have confidence in their learning capacities, S. LIVINGSTONE speaks about a *confident generation*. They consider themselves as experts much more than their parents, even if this expertise seems to be more on the order of talk than that of a real Internet literacy. A teenager builds his digital world alone, in an autonomous and individualized way. He personalizes his “my computer” (backdrop, welcome message, contact classifications, emoticon...) like personal territory, a sort of prolongation of his personality. He revindicates the right to be the only one to use the computer, to manage its navigation, to develop his relational networks, his leisure's and tastes with Internet independently of family norms and parental control. Like 12 year old Janis who surfs with her neighbour, “*but next year when I start the lycée, I think I'll want to go on the Internet alone and have it at home*”. Discussions between adults and youths about the Internet are very rare, “*actually, no discussion at all!*” add Mathieu, Lionel and Gregory, 16 - 17, during a focus group.

This adult absence in youths' ICT use can be related to the **wider context of a generational divide**. D. PASQUIER talks of *generational discontinuity* as a major social factor in juvenile socialization today. The first factor in this divide is the transformation of the family cell and parent/child relationships. For F. de SINGLY, the contemporary family has evolved towards two major transformations, the atomization of the family regarding the kinship and the autonomization of the individual regarding the family. The **contemporary family lacks intergenerational horizons** (De SINGLY, 2004); generations are autonomous from one another, not without ties but on free relationships, respectful, independent and based on logics of individual choices. The second factor is the prolongation of adolescence and its generalization to all social groups thanks to a longer and a massive scholarization and to the growing youth unemployment (GALLAND, 2006). As a third factor, we note the rupture in cultural transmission between parents and adolescents, reinforced by a double process of individualization and privatization on the level of leisure activities, which has been going on since the 80's. Activities which formerly were exercised in the public sphere have shifted over to the domestic sphere and have been individualized. The two adult and youth spheres

⁷ In anglo-saxon literature, some authors in tradition of cultural studies analyse this youth culture via case studies of computer practices, for example, the research of Diane PACOM and Sonia LIVINGSTONE.

⁸ Cfr FIZE, M. (1993) “Contribution à une sociologie de l'adolescence” in *Revue de l'Institut de Sociologie*, 1993/1-4, P.253-268

each henceforth have their practices and territories⁹ without really ever having a time or a space in common. The corollary to this process of individualization that we observe in the contemporary family and leisure activities is that **autonomy is becoming a « form of self-discipline »** (De SINGLY, 2006) with in counterbalance, a devalorization of authority, also observed in the Internet use by youths. We have noticed indeed few activities or moments shared by youths and their parents, which are often limited to the evening meal . Two youths on the panel have chosen “the fridge” as the object symbolizing their family! S. LIVINGSTONE has analysed this dual process -individualization and privatization- in the anglo-saxon context as a parental reaction: by favouring leisure at home and by providing youths with a whole digital and cultural environment, the parents intent to protect their children from the dangers and the insecurity of the street, even if those dangers are more imagined than real. Our observations confirm this « bedroom culture » phenomenon, which seems more prevalent among young girls¹⁰. Two remarks must be made on those observations: the first is that this norm of autonomy in ICT use does not mean that young’s want to take power thanks to ICT or to be independent, an image prevalent at first glance. Rather, they want to build themselves their individualized digital world. Secondly, this divide does not mean that youths and adults are in conflict. It's rather a matter of “**indifferent and peaceful cohabitation**” (PASQUIER, 2005 & 2006), a remoteness including from parents. These two spheres seem “to drive along different highway lanes at different speeds” but are not running into one another¹¹.

The internet, a learning stage

Fundamentally, **the pattern of youth socialization is changing**. It is no longer founded on the transmission and identification, whereby young people walk in their parents footsteps (HERSENT, 2003, p.23) but on *experimentation* (GALLAND, 2006, P.159). This **experimentation** is also a central characteristic of adolescence, a period of expectation authorizing experiences (VIENNE & DELFORGE, 2006). Young people's Internet use seems to be indeed an experimental field and, in that sense, the Internet is not a place where youths « flee » reality but a first stage for learning the life, for better adaptation to their daily existence. **This learning stage appears as a middle-land between the public sphere and the private sphere**, sometimes “for lack of something better”: for lack of public space for youth, they express themselves on the blogs, for lack of seeing they “*hang up*” (BOYD, 2006) together on instantaneous messenger services, for lack of going out to discover the world, like 17 year old Melissa who is kept home by her mother after two years of silliness in her village, they chat with unknowns. The 14-16 year boys, Bruno, Gary and Aloïs explain that they 'meet' girls on the instantaneous messenger services for not knowing how to proceed in the “real life”. They have no desire to stop there but say they learn their tastes and reactions. Or like 12-13 year old Charline, Emmanuelle and Janis who regularly assume the identity of older young women in chatting with others. C. METTON (2004) illustrated this phenomenon well, for in chatting one can infiltrate other worlds, experiment the opposite sex for instance and understand scenes from the adult world.

⁹ This phenomenon of individualization affects social milieu differently. One example on the level of possession of electronic equipment, 14% of adolescents from privileged milieu have a television in their room against 52% of under- privileged children (PASQUIER, 2006).

¹⁰This may have maybe to do with the Belgian collective unconscious marked by numerous moral affairs which jolted the entire country.

¹¹For Michel FIZE, adolescent culture is not a sub-culture or a counter-culture but another culture; which has never so escaped out of the control of adults and been so organized by the commercial universe (PASQUIER, 2005 & 2006).

More simply, the offer on Internet is massive and diversified and often renders adults powerless facing the demands, activities and desires of youths. Parents know less about the web than their children, especially in lower class (LIVINGSTONE, 2004) and it is hard to control contents without being seated next to the adolescent.

The weblog, an autonomous and reflexive experience

An obvious example of the increasing autonomy of the young and this generational gap is the weblog. Above all, it represents for youths a space belonging to them. Based on the website's technological offer¹², the young blogger creates his online world, where the tribe finds or assumes its place. This tribe moreover participates in the construction of that personal space and, hence, in the online personality of its author. That personality is incarnated in the pseudonym, the most symbolic mark of identity on the Internet but it is also expressed via the graphic appearance of their blog: the colours, the choice of photos, the arrangement of the notes. Relations, **contents and aesthetics thus work in the construction of the blogger's virtual identity, in reflecting sometimes deforming, his personality.** Hence it is not uncommon for the young blogger to change the design of his blog or even create a new space from one day to another in order to modify how he presents himself or the self-image he wants to put forward. For example, the weblog "le-jardin-du-bruit-envolé", in a note entitled « *I'm off to a new start* », informs his readers that « *here, this is no longer me... I don't identify with this anymore. [...] I'm beginning a new me* » elsewhere, at another address¹³. In existing as a personal space, the blog rapidly becomes a *territory* with its marks, its codes and rules, that any dissidents are invited to leave. Among the latter, figure the parents, doubly strangers in the adolescents' weblogs: strangers to their contents on the one hand and strangers from online practice on the other. This position of allochton is also maintained by the parents themselves, little inclined to explore the practice of their adolescents. That disinterest or **non-interference of adults into the ados' blogs makes the youths' blogosphere a Terra Incognita.**

This practice of personal and individualized blogging, with the aim to be connected with his peers, is not lived by the young as a "subjection" or a conformist practice. The youths' reflections about their own blogs testify to this. This **reflexivity takes place on three levels.** The first is based on the contents of their digital world. This putting his life online, in the form of narrations or images, leads the young blogger to reflect upon himself. Like a world in construction, always under building, the blog is transformed through the events of the adolescent's life, and the young blogger testifies to this quite explicitly: his blog can be renovated, interrupted, done away with, moved, pursued elsewhere, depending on the hazards of the adolescent's life. Monsieur-b for example, announces in the month of September a change in his blog : « *new ideas for a new blog and a new year. New things to discover, to read, to see, to share. A bit of everything, nothing, the strange, the logical, the interesting, nice, special, sad, about me, about you, about us, about the world around us and again many other things for this new blog placed under the sign of change, of novelty, ...* »¹⁴. These triggers of reflexivity about contents are often externals of the practice of blogging but take place in the face-to-face with oneself that the blog supposes and the confrontation with a third party it imposes.

The second target of the young blogger's self-awareness is precisely, this third party. In putting a blog space online, the youth exposes himself to the view and comments of others

¹² A website often chosen by relational affinity rather than by technical opportunities and which plays on that community sociability to increase its list of members. Example: the French website Skyrock Blog.

¹³ A note of 24 September 2006, <http://le-jardin-du-bruit-envole.cowblog.fr>

¹⁴ A note of 27 September 2006, <http://monsieur-b.skyblog.com>

blog members. Often sought out and encouraged, the presence of the other manifests itself by means of comments. Greeted in the territory, the visitor (often a peer frequented in the youth's real life) is thus entrusted with the mission of making remarks that reinforce the host, flattering him and describing their friendship. The important thing is maintaining contact not cutting communication. Tripping up in this mission (insults, tag-comments¹⁵) thus becomes the occasion for brushing up on the territory's implicit rules. Aside from this going beyond the limits, the youth's reflexivity about the public visibility of his personal space can also be triggered by the presence of an « intruder », an unexpected visitor or, again, a “persona non grata” on the blog. In this situation, frequently, the admitted, unmasked or visit of parents on the blogs of their adolescents triggers an awareness of the public nature of the blog. These unwanted presences astonish them (“*how did my parents know my blog address ?*”) but above all, make the author feel uneasy. This is the case with Mima, a 15 year old blogger who testifies in her blog that “*what I was doing there, I really have no idea. In fact... I began to fear that too many people come happen upon my blog...it's so simple to type on Google such and such a highschool, such and such a town... dumb things. And in fact, people have already happened upon my blog a few times, by chance. And that really scares me. [...] I want to preserve my anonymity...And then when I saw the commentary by Clic, maybe that pleased me but at night, I go to thinking ... Imagine that this Blogomag got to be a little popular. And I lay out my life without a thought, without seriously thinking an instant that someone might it. In reality, I'm saying that I really don't want someone to meet me in the street and recognize me as the writer of such things but it's especially the looks from the people in my entourage that scare me...*”¹⁶.

The third level of reflexivity of young bloggers is situated in the blogging activity itself. These moments of reflexivity are far from being systematic; they are even rather rare among daily Web- users. On the contrary, as the other two levels of reflexivity, there are trigger situations which set this self-awareness process into motion. « Blogging anniversaries », notes commemorating the first, second and third ... year of the blog are opportunities to raise critical question on one's activities, and on the tool itself, its potentialities, inconveniences and limits. The composition of the first note of a blog or the closing one also reveal the relationship that the young blogger seems to maintain vis-à-vis his blog. Finally, a last online upset incites the young person to re-position himself in his Internet activity: the virtual notoriety. This notoriety can progress gradually by « word of mouth » on the web, or in a more brutal way by making the youth a Blog Star on the website homepage¹⁷. In the latter case, the youth's sudden notoriety provokes a more or less critical self-awareness. These three levels of reflexivity with their trigger situations could illustrate well the self regulation process and tools shaped by the youth in their practises.

Generational divide and youth socialization

Few parents really worry about this generation gap, seeing it as something that has always existed. Some adults speak about this gap positively as the mother of 15 years old Aloïs saying : “*let them to make theirs lives, they have the right to be autonomous*”. **On the contrary, the older youths deplore** this parental indifference. They would have wanted more shared moments, discussion and regret their lack of interest on the part of adults. For all interviewed youth's, family value is important and they say that they get along well with their

¹⁵ By tag-comments, we mean « publicity » commentaries (Come see my blog, come and leave your com's on my blog), impersonal and left everywhere in the commentaries of adolescent blogs.

¹⁶ A note of 12 December 2005, <http://c0xynell.canalblog.com>

¹⁷ On this subject, the SkyblogStar phenomenon of the French website Skyblog Rock is notorious in French-speaking Europe.

parents. But, in practice, they only talk with them, in average, a quarter of hour a day. And this remoteness, separation seems to grow even wider for the *adonnaissant*¹⁸ generations: the lack of understanding that the older adolescents have lived through between themselves and their parents appears to them less worrying than what they perceive between their parents and their younger brothers or sisters 12 or 13 years old. “*My little sister is on another planet of clothes and girlfriends and she hardly sees my mother and father. They never talk to one another and I try talking to her but she doesn't care*” says Matthew, 18 years old. They say that they have had another education, have been more watched over than their younger brothers or sisters, who are on their own and their parents do nothing about it¹⁹. As 18 year old Isabelle says, “*the difference between me and my little brother is that my parents prefer to leave him alone with his playstation games or in front of the computer rather than educating him, for me, my mother always was always behind me*”. They say that they feel themselves to be very different from those teenagers, whereas only 5 or 6 years separate them. **Those older youths testify of a growing generational divide between parents and the generation of youths now reaching adolescence, the generation born in the MMB (Mobile, MSN, Blog) era.** According to those older youths, this a worrying question raised for the future.

This generational gap is questioning, regarding the role the adults traditionally play in the youth socialization. In the majority of traditional societies the passage from childhood to adulthood is characterized by an initiation rite. This ritual is composed of tests and oral teachings intended to bring about a radical modification in the religious and social status of the initiate. The child learns behaviours, techniques and institutions of adults and discovers his or her role in society. Nowadays, initiation rites are more and more disappearing but the search for meaning remains.

More pragmatically, from a sociological point of view, this generational divide observed in Internet use seems to have **three major impacts on the youth's socialization**. The first is the growing influence of what the literature qualifies as the « tyrannical » regulation made by peers but also by the commercial sphere on the social practices of the youth's. The second is a trend of “withdrawal on the self” including on one's own gender. The third is a weak connection with the past, which raises question particularly regarding the scholar culture.

D. PASQUIER underlines the **influence of the commercial sphere and peer pressure on juvenile socialization**. If the family no longer dictates codes and conduct, if the mechanisms of cultural transmission by parents and schools are blocked, then the entourage (the peers) and the commercial sphere take up the slack. The codes of juvenile sociability are particularly, D. PASQUIER even speaks of a *tyranny of the majority*. For this author, finally, what the youth has gained in autonomy regarding his parents, he has lost it with his peers. This peer pressure in Internet use of youths must be more studied. But in pushing this reasoning to the extreme, a youth today doesn't exist without permanent group approbation, without this horizontal sociability ceaselessly in activity even into their bedrooms. This questions Olivier TREDAN who shows that *the permanent gaze of others has a structuring power for these online identities* (TREDAN, 2004, p.45). Where the final freedom for a youth is to disconnect himself...²⁰ From a regulatory point of view, it means a self regulation quite binary, radical and without deliberation. This pressure seems to be a conformism pressure. *We can with difficulty imagine that there are no relation between the fact that parents transmit less of life instructions and the development of a generational culture which manifests a strong intolerance to individual differences* (PASQUIER, 2005, P.165).

¹⁸ Title of the last book of François De SINGLY, cfr bibliography

¹⁹ The older brothers take up the torch, especially for the little sisters, sometimes via closely space surveillance calls by short messages during party's.

²⁰ Even if, paradoxically, Internet and chatting specifically allow to escape of this tyranny of the majority. Internet use of youths show us many paradox which are in many cases, just two faces of a same reality.

A second impact related to this generational divide regards a phenomenon of fragmentation and of **withdrawal on itself**, underlined for example, by the Mediappro research: “*expression, communication and games between peers will maintain relatively isolated networks for a long time, forming a mosaic of small, similar tribes that turn in on themselves*” (Mediappro, 2006, P.58). We have seen for weblogs, the visitor flatters the blogger for fear of confronting difference. 16 year old Gary on My Space, only looks for profiles that fit his own profile. A Belgian forum, «barakie.be», functions on contempt of “the other different of me” and the exclusion. In this vein we have observed, even if we have to remain prudent and nuanced, that girls and boys have their favourite practices, among themselves, acting on traditional masculine or feminine elements (typically, strategic, ludic, violent practices like networks games, jokes or gores websites for male /sentimental and emotional practices like chat, instant messenger services for female²¹). During an interview, the girls lend to their activities subjective significance, the boys talk about technology, free programmes and consider technology for its own sake. Could we do a hypothesis of a re-emergence of the traditional gender divide, intensified with the technology? In any case, girls seem to be more “secret” in their practices (webactivities from the domestic sphere, based on restrained relational networks, duos or trios) than boys (webactivities based on extended relational networks). We see clearly that *if the parents have lost a great part of their power of regulation, individualities cannot for all that express themselves freely. The search for authenticity unceasingly runs up against adolescent culture codes as well as an - often masculine - definition of situations* (PASQUIER, 2006, P. 13).

Finally, how a generation which is constructing itself in present, by itself, can project itself in the future? Because this separation between youths and adults means also an **absence of inscription in the past that gives reflexivity, detachment from self and others**. This absence of a clear relationship to the past is very tangible in the world of school. The literature approaches this problem by pointing out the difficult coexistence between youth culture and school culture. Young’s are the world of other culture *not defined by a generational belonging, the culture of work* (De SINGLY, 2006, p. 28) and the culture “legitimate” and humanist. That’s means for young’s, *a certain form of anti-intellectualism (...) and a valorization of eclecticism*” (HERSENT, 2003, p. 12). The Internet use of youth’s seems shape indeed a culture of immediacy and the shared emotion with social valorization of the speed, the «feeling » and with values as the authenticity, the self-expression and the “always on” communication. **This webculture clashes with the traditional humanist culture of the school**, which is linked to a past and founded on bodies of knowledge. Professors have to teach cultural objects like history or literary currents which no longer make any sense in the youths' cultural universe. More fundamentally, the “time” of school, a “metronomic society”, founded on the historical time, biographical and linear, *invaded by disciplinary like subjection to schedules, delays, buzzers, duration and order of courses, class days and vacations* (LASSEN, 2001, p. 99) is no longer the time of youth, who lack in their social life of temporal self-discipline and emprise of historical time. Theses young’s who *do not feel themselves to be “artisans of their destiny” (...) experiment with zigzagging trajectories (...) and imagine a range of virtual choices and not a single linear route* (LASSEN, 2001, p.285).

²¹ More generally, the cultural female universe remains little studied. One could point out the Diane PACOM research about Canadians young’s girls. In this research she observes that young girls, like every social group, create their own universe of significations, values and symbolic representations, different of young boys and women.

The adolescent facing the law : between incapacity and autonomy

From a **juridical point of view**, the minor is in principle considered to be in a state of general **incapacity**, which means that he can not validly pass juridical acts alone²². In Belgium, majority, which ipso facto involves full capacity, is attained at 18 years of age. But is the under 18 year old minor really incapable ? The rules on the incapacity of minors date from 1804, the year the French civil code was edited. It tends to protect minors and their potential patrimony against unwarranted acts. There are some exceptions to this rule. Notably, it is accepted that the minor only accomplishes the acts considered those of daily life. For that, the minor must possess **capacity of discernment**. Capacity of discernment is a factual element which is concretely evaluated by the judge in terms of particular circumstances. In general, courts and tribunals estimate that adolescents do possess capacity of discernment. Since 1804, the autonomy of youths has never stopped increasing. Likewise, the domain of acts considered as forming part of daily life and able to be accomplished by the minor alone has considerably widened, so that it would seem wiser to speak of restrained capacity²³ than of incapacity.

Changes brought about by ICT in adolescent autonomy and freedom

Messages circulated by means of traditional medias, for the most part, emanate from professional journalists, bound to respect the deontological rules of the profession. On the other hand, the new medias allow **any adolescent** who so desires to become a **broadcaster** of contents potentially accessible to all internet users, as any journalist. Thanks to ICT, the adolescent has attained a public space and a power of expression heretofore unknown. For the adolescent who is a broadcaster, a question arises as to the awareness and knowledge which would allow him to exercise this power in a free, enlightened and responsible way. In a State of law, all freedom ends where that of others begins. It is hence inextricable from liability. How are we to think through the liability of adolescents in knowing that it is the other side of the coin of freedom, all the while taking into account the goals of protecting minors, translated by their juridical incapacity? We shall return to this. Where the adolescent has attained a potentially large audience, the need for a transmission of knowledge and values on the part of parents and teachers makes itself that much more urgently felt.

If he has become a broadcaster, a full-fledged actor on the net, the adolescent is also a **spectator, a potential reader of everything found on it**. The great advantage is that now, no matter what his centres of interest are, the adolescent can satisfy his curiosity rapidly and easily, without spatial nor temporal limits. The problem is that if he has access to the best, he also has access to the worst (racist propaganda disguised in various real events, games inciting hatred, violence, pedopornography...) in passing through the mediocre and everything that can distract him from his initial research. Search engines deliver it all helter skelter, without sorting or preliminary description of the goals of the material's authors. This early confrontation with illicit, dangerous or simply harmful contents makes the necessity of having adequate parameters for verifying the origin and veracity of documents, for sorting and choosing those which nourish research and for avoiding what he is not ready to confront that much more keenly felt.

²²For a detailed analysis of the question of the capacity of minors related to electronic commerce, see M, DEMOULIN. (2007) « Les mineurs et le commerce électronique: besoin de protection ou d'autonomie ? », *J.T.*, n° 6255, p. 105-116.

²³ H. de PAGE (1990) *Traité élémentaire de droit civil belge*, 4ème éd. by J.P. MASSON, Bruxelles, Bruylant, p.1125.

Youth autonomy and self-regulation

From the outset, European and international authorities have favoured self-regulation where new technologies are concerned. This is the case both for texts issued by the European Union²⁴ and by Council of Europe²⁵.

While it presents certain advantages, such as being more flexible, more adapted to the context of the new medias than State regulation, self-regulation nonetheless runs the risk of accentuating the divide between parents and children. Adolescents surf far from parents who, hypothetically, are reassured in knowing that all sorts of self-regulatory organizations are on guard and that network actors impose their own rules on themselves. Yet in a breach between parents and children which keeps on widening, commercial sector actors are rushing in, seeing youths as potential consumers, infiltrating by *educating them* and *initiating* them into becoming 'good consumers'. In this regard, the Mediasmart site²⁶ is an edifying example. It defines itself as 'an educational site on medias' for children from 6 to 11 years old, created by announcers in collaboration with teachers' associations. It notably includes a set of exercises, brought to the teachers' attention, permitting 'the formation of a critical spirit in students'. The exercises stimulate creativity and are all developed around commercial choices, ways of being convinced about these choices, budget management, etc, stressing uniquely the consumer dimension of children beginning at the age of 6 ! All the other dimensions of being, which are essential and structuring and which should be transmitted well before 'the capacity to be a wise consumer' are consigned to oblivion. It is significant that precisely this site is pointed to by authorities of the European Union as being an excellent example of education aimed at medias. Youths thus see themselves reduced to their commercial dimension with the benediction of all. They themselves often measure their freedom and their autonomy in gauging their capacity to purchase online.

From a juridical point of view self-regulation, and particularly educational initiatives, should be assessed in terms of legitimacy: has the norm be elaborated by those who represent minors' interests? Shouldn't minors or at least adolescents themselves participate in a way or another in the elaboration of self-regulatory norms?

Autonomy , freedom of expression, press and democracy

In Belgium, freedom of expression is a right guaranteed by the Constitution. For that matter, this right has been explicitly recognized for children by the International Convention of children's rights (article 13). Yet this right is still wider for the press who, given its mission, is granted specific guarantees. This involves the explicit interdiction of censorship, the interdiction of bail, the exclusive competence of Assize Court for press violations (except for press violations inspired by racism or xenophobia) and serial responsibility. Since the Goodwin case²⁷, we know with certainty that journalists also enjoy rights to secrecy of

²⁴ Let's point out, for instance, the various texts concerning the 'Safer Internet' program: Decision n° « 276/1999/EC of the European Parliament and the Council of 25 January 1999 «instituting a multi-year community program aimed at promoting the safer utilization of the internet and new online technologies in the fight against messages with illicit and harmful content, principally in the domain of the protection of children and minors », OJ n° L33 of 6/2/1999 ; Decision n° 854/2005/CE instituting a multi-year community program aimed at promoting the safer utilization of the internet and new online technologies, OJ n° L 149.

²⁵ We notably point out Recommendation n° R (2001) 8 of the Committee of ministers to the member States on the self-regulation of cyber-contents (the self-regulation and protection of users against illicit and harmful content distributed on the new communication and information services).

²⁶ www.mediasmart.org.uk

²⁷ Eur Court. H.R., Goodwin v. United Kingdom, 27 March 1994, *A&M*, 1996, p. 351 and ff., obs. D. VOORHOOF.

sources. The press's mission is to inform the population on questions of public interest and so exercise a function of control on public authority (its mission of being the « watchdog » of democracy).

The question that arises is knowing whether one can transpose the notion of 'press' and, consequently, the specific guarantees of freedom of the press to Internet applications and, notably, to adolescent blogs.

If the Belgian Supreme Court's ('Cour de Cassation') interpretation of the notion of press, which restrains the application to media to the written press via the printing process, appears to go against the will of the Constituent, we do not think that an interpretation as wide as the French interpretation²⁸ is desirable. In Belgian law, the press should be defined in relation to its mission, to those who exercise it - meaning journalists - and to conditions which are linked to the exercise of journalism (concerted editorial activity, deontological rules, organized distribution). The constitutional guarantees of interdiction of censorship and bail, of serial liability and of the competence of the Assize Court for press violations thus apply uniquely to those who exercise the mission of informing citizens on all questions of general interest, whatever the mode of communication or distribution by means of which they exercise that mission. Consequently, the specific guarantees of the press do not apply to adolescents blogs.

That said, all others expressions by means of the Internet or convergent technologies enjoy the guarantees of **article 10 of the European Convention on human rights**. The Internet and convergent technologies offer possibilities of expression, of exchanges of ideas, of public debate on a planetary scale undreamed of in the time of traditional medias. The debate is substantially widened : it is no longer reserved just to writers, politicians and journalists and each individual can bring his stone to the edifice. Thus adolescents have attained the possibility of making their voices heard in an immediate way. This widening of the debate is of capital importance for a democratic and, consequently, pluralistic society. In the manner of the European Court of human rights, the national judge should modify²⁹ his evaluation of the liability of he who expresses himself according to the measure of the importance of that expression in the democratic society, being the ultimate reference of the European Convention on human rights. To do this, he should take a series of parameters into account. **He should thus take into consideration the author of the litigious expression, his potential public, and the credibility that the public is liable to accord him.** Thus, the liability of a youth who, on his blog, accuses a person of fantasist and slanderous things is not the same as that of a politician who might express himself thusly on *his* blog. The judge should also take into account the person or the organization targeted by the litigious expression. If it is, for example, a question of the government or one of its members, the judge should permit more severe, or even more provocative critiques than if a teacher is in question. Generally speaking, if the person or organization targeted wields power – and we are not just talking about political power - the critical remarks may be more virulent than for a person or organization who does not wield power. Finally, judges should take the goal of such communication into consideration. Thus, a message of a commercial character benefits from less protection than a message criticizing governmental politics.

Thanks to the direct effect of article 10 of the European Convention on human rights and of the strict conditions that have to be fulfilled by exceptions to the freedom of expression in the Belgian juridical order, one need not associate all non-private expressions with the press in order to guarantee a freedom of expression worthy of the name in a democratic society.

²⁸ France has opted for an evolutive interpretation of the notion of the press. Thus, the recent French law « *for confidence in the digital economy* » of 21 June 2004 (abbreviated LCEN) extends the notion of press to every expression of thought whatever the media chosen. The sole exceptions to what is described as press are messages intended for a « a closed group of users ».

²⁹ Most of them do it in a more or less implicit way.

Adolescents facing certain limits to their freedom of expression : cyber-teasing

Among adolescents, the personality and identity are in development. Their place in the group and group recognition are points of crucial importance for them and take part in their identity construction. One can certainly anticipate a reduced power of resistance in facing attitudes of harassment from a group 'leader': to maintain their place in the group, to appear 'plugged in', adolescents tendency to go along with the teaser, to join together against the chosen victim, the 'scapegoat' of the band, or even to go further in an attempt to be 'cool'.

Yet this behaviour can have a much more profound impact, in that the victim, with his identity in construction, is more fragile. Exclusion or rejection phenomena, be it only temporary and apparently harmless, can leave indelible traces on the victim without the authors being aware of the scope (or sometimes even of the existence) of the disaster they've caused.

Whenever the teasing is committed by means of ICT, it is not face to face. This absence of direct confrontation removes inhibitions: hidden, one is more daring, one goes further in aggression, in rejection, in exploitation of the victim's weak points. The fact of not being confronted with the distress he causes allows the blogger to hide his face, to be unaware of what he's doing and, a fortiori, of the consequences that may ensue. ICT also allows a very wide distribution and an almost universal accessibility to what, in former times, would remain in closed committee or, at worst, be known to a few witnesses.

How to react to teasing situations among adolescents? Of course, the (penal and or civil) liability of one or more teasers/harassers can be tested before the courts. But judicial procedures present a certain number of inconveniences, such as slowness and an awkwardness which are in flagrant opposition to the ICT world. Moreover, if sufficient proof of harassment is not brought, the victim may see himself as once again thwarted in his suffering and may live it as an aggravation consequent upon the harassment phenomenon.³⁰

It seems to us that an interesting response may be found in **mediation**. Beyond the fact that such a solution is faster and less burdensome, it reintroduces a face to face, facilitating the author's becoming aware of what the victim has endured (the consequences of his acts) and teaches respect for contradictory debate. Mediation initiatives for solving problems between youths by youths, like 'SJAPO'³¹, which is present in many schools in Flanders, should be encouraged, favoured and developed. In fact, some youths in schools take a rather long training course to become mediators and form a mediation committee within the school. This training involves education in the principles of respecting others, of openness of spirit, of contradictory debate, of respect of rights of defence, of human dignity ... These principles, which found democratic societies, also inspire most legislation in the area of contents regulation. Beyond the fact that the 'mediators' benefit from a rich formation which is a great help to them in learning about life in society in general and about ICT in particular, the whole school, where this system is applied, is made aware of these essential values of democratic societies. We add that this response to conflicts stimulates creativity and reflection as to the types of reparation most appropriate for making amends in these problem cases, solutions which will be different from the payment of damages and interests (inappropriate for minors) or judicial penalties.

³⁰ This is called secondary victimization.

³¹ Acronym of 'Samen Jong Anders Problemen Oplossen', could be translated as: Solving problems together, young and differently.

Adolescents facing certain limits to freedom of expression : copyright

Unlike the case of Anglo-saxon law, in Belgian law (as in most continental juridical systems) the very act of creation gives rise to copyright, with no particular formality having to be enacted. This means that a design, a logo, a photo, a poem or a song, accessible online, is not always free of rights, even if no particular system of protection prevents their reproduction. How often have we heard: « *I found this on the Internet. Why can't I just recopy it onto my blog?* ». ³² It seems that, generally speaking, these rights are rather unknown to adults and even more unknown to adolescents. **Respect of these rights requires educating teenagers, but first of all adults.** Beyond information and education regarding the law itself, we need to inform and educate as to the goals justifying it. The initial goal is to offer recognition, on the one hand, and a remuneration for the creation, on the other. This also supposes, on the part of courts, an **interpretation in conformity with the goal**, so as not to denature the right. For if it is interpreted too broadly, it will lose its meaning and tend not to be respected. In general, youths are responsive when they themselves are victims of a violation of author's rights, when one of their poems is recopied on another blog without mentioning the author's name, for example. This sensibility can be the point of departure for **education in reciprocity**.

Adolescents, liability and guilt

Searching for the liable person can be envisaged from the viewpoint of the youth who is the victim of an illicit act or from the viewpoint of a youth who commits an illicit act by means of ICT.

Whenever a youth is a victim of an illicit act committed by means of information and communication technologies, the question is one of knowing who is liable, given the number of actors using the net. This question refers notably to the **liability of network intermediaries** ³³. We shall not develop this aspect in the present report. We shall simply point out **article 299 of the Belgian penal Code**, which requires the mention of a liable editor for all 'written matter'. Unlike what is the case in France, this measure has no **equivalent in the new medias**, so that it is sometimes quite hard to identify who's liable. Extension of this obligation to the new medias seems desirable both from the viewpoint of the identification of liability and from the viewpoint of the exercise of the right of reply.

Whenever a young person commits an illicit act, the question can be examined from the angle of both penal liability and civil liability. In this report, we share a few thoughts concerning **civil liability**.

Civil liability regulation, dating from 1804, has the principal goal of ensuring compensation to the victim for damages he has suffered.

A minor can be held liable for his own acts from the moment he has attained the age of discernment. In the view of juridical security, certain authors favour the legal determination of the age from which the minor is presumed conscious of his acts, whatever the particular circumstances. By means of ICT, adolescents can cause particularly weighty damage in that they may potentially reach a large audience, without always being conscious of the public character of their expression.

³² It seems that a certain consciousness exists for the musical sector, but that it is largely insufficient in the other sectors.

³³ This matter is dealt with on European level in the Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce in the Internal Market, O.J.E.C., 17/7/2000, n° L178/1.

The notion of wrong which involves liability requires the capacity of discernment on the part of the author. But the complexity of the matter, the multiplication of actors and the generational divide accentuate a general unconsciousness. While nobody should ignore the law, we should envisage, beyond **education in juridical rules, education in the values underlying them**. Education of youths necessitates the education of teachers and the awareness raising of parents. Only if this education is set up systematically in educational institutions before a certain age (13 years of age for example) can one suppose that such a discernment will be attained from that age onwards.

If the minor's liability be justified by the autonomy he benefits from and if the liability is proportional to the freedom, the problem of his relative inadequacy for meeting the goal of guaranteeing compensation to victims remains, given the insolvency of most minors.

To make up for this lack of adequacy in compensation to victims suffering damages, **the minor's parents' liability** may be invoked. Whenever the minor causes damages to a third party, the parents are presumed to have acted wrongfully in the education or surveillance of their child. This presumption of wrong is justified by parental authority and is based on the rather unrealistic idea that if the minor had had a good education and had been watched over correctly, he would not have committed an offence (or an objectively illicit act). Unrealistic from the outset, this idea is getting more absurd all the time and even more pointedly in ICT use, not only given the evolution of principles of education but also the empowerment of youth and the generational divide. Moreover, this system links liability to guilt. The extent of the guilt born by the parents is further accentuated by this present-day tendency, transforming victims into heroes³⁴. Yet given the goal of compensation, the system is inefficient insofar as the presumption can be reversed: if the parents can offer proof of good education and diligent surveillance, they won't be held liable and so the victim is not compensated, whatever the extent of damage he's suffered.

The **teacher's liability**³⁵ can also be invoked in case the student acts wrongfully during the period when he is under the teacher's surveillance. This is founded on the authority the teacher exercises over the student. The teacher is thus presumed to have acted wrongfully in the student's surveillance. The pertinence of the teacher's liability and authority over an adolescent student can be seriously called into doubt in an era where the latter may be on the Internet or using his mobile phone at school. Even if the teacher is protected by immunities (his responsibility is guaranteed by the educational institution or by the State in terms of the type of institution he exercises his functions in), the same critique can be voiced here as it was in case parental liability. Since the presumption may be reversed, in case of reversal, the goal of victim compensation is not attained. If **educational institutions** are not considered teachers, their liability can nonetheless be invoked in case of teacher's wrong. Thus, in the '**free education system**', the educational institution (committing the infraction) is presumed to have acted wrongfully in case of a wrong of one of its teachers. This presumption is undeniable and is hence more capable of responding to the goal of victim compensation.

In the '**official education system**', the teacher's wrong, he being an extension of the State, ipso facto involves the latter's liability. Of course the **own liability of institutions** (educational or for the protection of youth) can also be invoked. Thus the burden of proof rests on the victim: it is up to him to show the institution's wrong and the chain of causation between the wrong and the damage. So a bad organization of the surveillance to be exercised regarding the minor or a bad execution of that surveillance may constitute such wrongs. In the ICT domain, institutions which place computer materiel in the hands of students or

³⁴ See in this connection, the excellent study by Caroline ELIACHEFF and Daniel SOULEZ LARIVIÈRE : *Le temps des victimes*, Albin Michel, 2007.

³⁵ A teacher is conceived as any person charged with a mission of instruction, a mission which has been interpreted very broadly by the 'Cour de cassation' (Cass., 3 Dec. 1986, Pas., 1986, p. 410).

adolescents they are in charge of have every interest in being able to show that they make them aware of the risks that the use of this materiel may involve, for example in making students sign a code of conduct regarding use of ICT in school, in putting in place precise rules for use, in using filters to avoid access to violent, pornographic or other harmful contents,...

As we see, in regard to the goal of victim compensation, the formulations involving parental and teacher liability are poorly thought out in that the presumption can be reversed. Moreover, they are inextricably linked to the notion of guilt of those 'presumed liable', which is no more realistic (and never was) and puts a heavier burden on their shoulders. Rather than connecting civil liability to the notion of wrong (and thus of guilt), we should foster an **evolution towards a system of objective liability of parents or educational institutions founded on the notion of risk**. This would discharge those liable, as well as the minor himself, from the burden of guilt while in any case ensuring reparation for victims. This objective liability might then be linked to obligatory insurance. For educational institutions or youth aid organizations, this insurance might be paid by the subsidies they benefit from, thus distributing the 'risk' to the community.

Contradictory debate and the right of reply

If freedom of the press is an essential component of a democratic society and allows an exercise of control on the powers in place, it is only right that it should be in turn controlled by the citizen to avoid having to cope with an all-powerful press.

The right of reply has its place here and offers a very interesting reaction to any person designated by a media in that it guarantees the contradictory character of debate, enhances respect for others and does so without entering into court procedures nor posing the delicate question of liability. Existing legislation in the area of the written press and in the audiovisual area also applies to the new medias, but the **need for regulation adapted** to the latter is making itself felt for, in practice, the periodicity condition of written media notably risking to pose problems. The adoption of legal measures for introducing the right of reply into online medias is recommended by both institutions of the European Union and the Council of Europe and is seen by the latter as a measure ensuring better protection of minors and human dignity in all online services.

In a context where support very often includes spaces for response, reaction and commentaries, one might wonder whether the right of reply still has a 'raison d'être'. We hazard a guess that it is less useful than in the traditional medias, insofar as numerous spaces for response and reaction already exist due to the very nature of public spaces on the net. We are doubtlessly witness to a greater number of spontaneous rectifications or reactions in the spaces set aside for that than ever. Yet, the freedom of spontaneous response is not total: there are always closed sites or closed parts of sites, or moderated sites, etcetera.

But in order that this right might allow us to ensure a better protection of minors and human dignity in all online services³⁶, there should be among youths **awareness of values like** respect for others, freedom of expression and the contradictory character of debate, as well as consciousness of the existence of a right of reply as a guarantee of these values. How should this right of reply be exercised by the adolescent minor? Could he act alone or should he have recourse to services and/or consent of an informed adult ? To the extent that he expresses himself without parental consent for the contents he puts on the web, it seems to us that an adolescent having gained capacity of discernment can also respond alone to critics or inexact

³⁶ Recommendation of the European Parliament and the Council of 20 December 2006 (2006/952/CE) on the protection of minors and of human dignity and on the right of reply in connection with the competitiveness of the European industry of audiovisual services and online information, J.O.U.E. 27/12/2006, n° L378, p. 72-77.

allegations without for all that having parental consent. On the other hand, he should have the possibility of talking with an informed parent, teacher, educator or family member, to consider together the best way to answer and learn about the legal conditions of the exercise of that right. Hence the need for information, education and awareness raising of parents, teachers, educators and youth aid organizations concerning the rights and obligations of adolescents using these new medias and, notably, concerning the right of reply.

To conclude

Such is the paradox of the Net: it is supposed to build bridges between individuals and communities but at the same time, exacerbates tensions between gender, increases individualization within families and acts as a catalyst for division within tribes based on the self. Adolescents and adults appear to evolve in parallel worlds, each following its course with little regard for the other. Older adolescents themselves invite us to build bridges between these worlds and to re-establish a dialogue so that transmission from one generation to another might carry on: transmission of knowledge, transmission of the way to be and the way to act in society; transmission not unilateral (from adults to adolescents) but reciprocal (including what adolescents have to teach adults); transmission allowing opposition and construction of identities.

We have chosen the example of cyberteasing, a common phenomenon among young people that well illustrates the impact of the generational divide. The cyberteasing expresses well the power of peers, the tyranny of the pressure to conform, and the recrudescence of anonymized aggression (anonymous in the sense that there is no physical confrontation) that is part of this phenomenon. Mediation offers an especially interesting response to cyberteasing. In mediation, young people are trained by adults to become mediators by training to democratic values (respect for others, initiation to contradictory debate, open-mindedness, respect for the rights of the defence). By this means young people are taught to remember the principles that underlie legislation that applies to content regulation. Such training of young people by adults constitutes a bridge between the two worlds by re-establishing the existence of mutual transmission. Transmission creates confidence and autonomy, since young people who are mediators fulfil the role of conciliators within society (represented by the school). Transmission can stimulate the natural creativity of young people who, after having heard both parties to a conflict, look for solutions that can satisfy the interests of the offending party and the victim. Decisions made by mediators are supervised by adults: a new bridge is created because adults can learn from the restorative creativity about how to solve their own conflicts, and can pick up ideas on how to understand young people. By raising the question of copyright, we invite parents to get involved in the blogosphere of adolescents, and to take an interest in their many creations on the Net. By exploring these, adults create a bridge that is one of respect for the creativity of the generation of teenagers. This bridge built out of listening and respect can be the source of the beginning of education in reciprocity, as it well known that respect creates respect. The question of civil liability for the acts of adolescents also creates links between adolescents and their parents in terms of failure in education and in surveillance. These guilty links, which do not benefit the victim, are not of a constructive nature. Could we not imagine liability as an invitation to shared creativity: if a teenager is at fault (or negligent), this involved youth should have to go with his or her parents in search of a remedy in terms of the victim. In that case, one positive bridge could be constructed between the youth, his parents and even the victim (in the reestablishment of face to face contact). The possibility of the right of reply is something along the same lines, a creative solution that does not involve to find a guilt. This possibility does require education about respecting others, about freedom of expression, and about the contradictory nature of debates

in democracy, including a guaranteed right of reply as one of the basic values to be upheld. This educational initiative would build yet another bridge which could be crossed in both directions. Mediation and right of reply constitute creative answers to infringements of the rights of persons that demonstrate everyone's creativity. These responses creating confidence and autonomy allow a positive and solid construction of identity. The same cannot be said of the system of civil liability based on the culpability that causes rejection and ill will, attributes that have never been part of bridge-building.

This research creates interesting interactions between sociology, law and communication science showing the force of this cooperation in the elaboration of regulatory tools that are well adapted and able to be appropriated by young people. It gives an empirical evidence of the necessity of anchoring legal reflection in detailed and comprehensive sociological and cultural observation of teenagers' practices.

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iGDSS – Software Framework For Group Decision Support Systems

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Abstract

This paper emphasize an innovative approach within the area of Group Decision Support Systems (GDSS) by using tools based on intelligent agents. It introduces a software platform for business process management, electronic decision support and collaboration implemented within a EU co-founded project (FP6-DiFac) and a national one (research of excellence-CEEX)

On a technical level iGDSS focuses on developing a conceptual tool where any third party can contribute with creative ideas for modeling the decision process. It also focuses on designing and developing an innovative method for distributed collaboration, and realizing a working methodology using a software platform for group decision assistance.

On a social level, it refers to increasing the transparency, creativity and democratization of the decision making process by means of selecting the participants to this kind of processes, delocalization and decentralization.

Keywords: Group Decision Support Systems (GDSS), Multi Agent Systems (MAS), anthropocentric interface, decisional tools, decision support system (DSS)

1. Introduction

Modern globalized economy has forced public and private organizations to use ICT not only for increasing the personal productivity of individual employees (traditional approach), but also for enhancing the collaboration among the members of various kinds of teams (both co-located and remote ones) and for increasing their collective effectiveness. Thus, teams are considered as collections of co-located or remote individuals working for a common goal, who must interact extensively in order to achieve this goal (Loukis and Kokolakis, 2003). Value is created in whatever way is appropriate, no longer dictated by organizational relations and boundaries.

The latest trends in distributed and mobile collaboration technologies allow people to move across organizational boundaries and to collaborate with others within/between organizations and communities. The ability to query the company's distributed knowledge base and to cooperate with co-workers is still a requirement, but new paradigms such as Service-oriented computing (e.g. Web Services), increased pervasiveness and mobility enable new scenarios and lead to higher complexity of systems.

Due to their incompleteness, the rigidity of the actual decisional models employed in GDSS has been criticized on a number of grounds (Whitaker, 1992). The main inconvenience refers to the fact that actual GDSS cannot foresee all the steps required for reaching a consensus, nor can support in a flexible way a wide range of group decisions for the latest emerging organizational phenomena (i.e. work group autonomy, responsibility of professional roles, the flattening out and decentralization of organizations (Zamfirescu, Căndeă and Luca, 2001). This can harden their use, leading to the users' rejection. Therefore, it is of major importance

for every organization to be able to customize a decisional-making system so as to map its own needs as well the users' ones (employees, middle and top management).

A GDSS is more than just a single informatic product implementing a certain method for assisting group decisions. It is supposed to integrate both the corresponding software modules for the decisional methods and techniques, as well as other general informatic and communication-related components (Filip, 2004).

In order to accomplish the premises stated above, the system referred to within this paper was built as a decision support framework, where besides the already existing tools any third party member can add its own custom-made ones. The framework enhances the decision assisting tools to run within a context made up by entry data, participant members having certain rights and a repository database for storing the results. At the same time, one can also refer this solution as a MAS (Multi Agent System); this paradigm offers a new dimension with respect to GDSS integration with complementary services, making it easier to build complex and flexible architectures suitable to organizational settings. MAS are software systems composed of several autonomous software agents running in a distributed environment (Zamfirescu, Căndea and Luca, 2001). During a decisional process the participants follow a workflow in which they are guided by the multi-agent system based on the path that they choose through that workflow.

Therefore, few of the main units of the currently described platform are the following: intelligent agents, workflow, collaboration, decision making tools, data storage and security. The remainder of this paper is organized as follows. Section 2 depicts the main characteristics of the framework and the reasons for which it has designed. It is followed by section 3 which gives a glance upon the anthropocentrism of the system. Section 4 presents the idea of an intelligent workflow composed of decisional steps.

2. The Framework

Decision-making is a knowledge-based behavior. iGDSS is designed to be a collaborative decision-making support system with safety, utility, efficiency, effectiveness, and usability. The development of iGDSS is based on the principles of GDSS, interactive software and related development techniques. By taking advantage of abundant information on the Internet, networking and database technologies, iGDSS provides decision-makers: comprehensive information access to internal and external data, communication facility, and friendly interface with multiple-user access. On a higher level, iGDSS focuses on developing a conceptual tool where any third party can contribute with creative ideas for modeling the decision-making processes – “third party” tools.

The main concepts of the framework are: *decisional sessions* or simply *sessions* and *decision assisting tools* or simply *tools*.

Decisional sessions are virtual places through which the decision maker actually participates in the decisional process and basically, they are placeholders for *decision assisting tools*. These *tools* are the pieces of software that support collaborative activities like brainstorming, voting, discussing on certain topics, etc. Thus, decision makers will take part in brainstorming sessions using a brainstorming tool, in voting sessions using a vote tool, and so on.

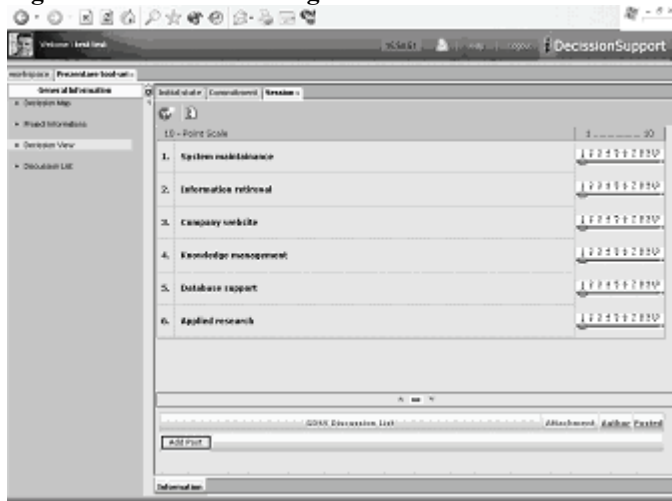
From the point of view of the decisional process, inside the iGDSS every process is composed of decisional sessions which are well temporally determined – including the starting and finishing time as well as the list of participants, the topic and the basic documentation. The session's parameters can be altered by the participant with the necessary

rights as long as it hasn't started yet. After a session is finished, its results can be used as input data for another session. There are a set of rules that have to be respected by all the tools in order to run inside the framework and to be part of a session succession. Section 4 will detail this succession in terms of a workflow.

iGDSS is made up of few initial tools aiming to assist the user in the decision-making process:

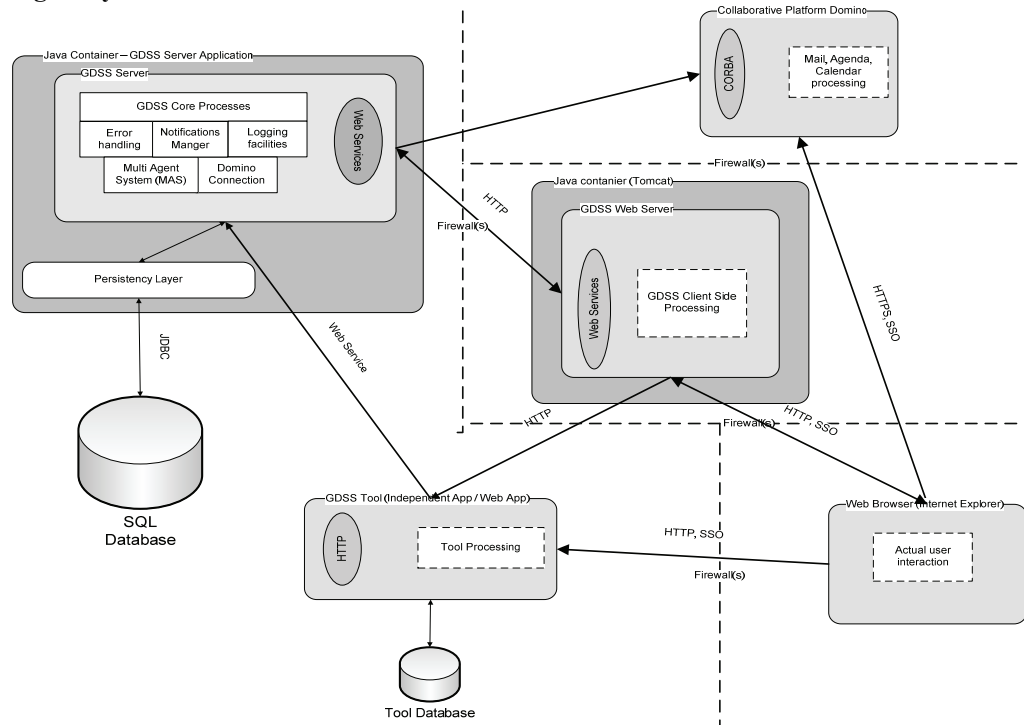
- *Electronic brainstorming* is an idea-generating tool that allows participants to share ideas simultaneously and anonymously on a specific question posed to the group.
- *Categorizer* assists groups in three common group activities: generating lists of ideas, brainstorming comments that elaborate on or support the ideas, and creating categories for the ideas.
- *Group Outliner* help teams generate and / or organize ideas into the familiar hierarchical structure of an outline.
- *Topic commenter* helps groups comment on a list of topics. Participants can also be given the ability to add topics.
- *Vote* is an evaluation tool capable of providing the basis for a group decision. This tool is also commonly used to determine the degree of group consensus. A vote activity in which users grade different issues with grades on a 1 to 10 scale is shown in Fig. 1.
- *Alternative Analysis* is in many ways similar to vote, but with added power and flexibility. In addition to handling straightforward, single-lists of ballots, this add-in tool allows rating a list of alternatives against a list of criteria.
- *Survey* allows gathering information from a group on any topic at any time.

Fig. 1. 10-Point scale voting



The system was designed and developed so as various decisional processes can easily be implemented without needing any alteration throughout the application and can answer the users' requirements and decisional flows. In this way, an open architecture was obtained, which can be integrated with other systems such as a collaborative platform (used for managing the users, user groups, individual or group agenda) or other decisional tools (i.e. ERP financial reporting tools.). To facilitate a flexible integration with the collaborative platform and with different tools the following architecture is proposed. (Fig. 2).

Fig. 2. System's architecture



As depicted in fig. 2. the iGDSS systems is composed the following: a) a main server which supports the basic functions and manages decisional processes logic, b) a relational database (Postgre, MySQL, SQL Server or Oracle) c) the web-server that runs the user interface, d) the collaborative platform (which communicates with the main server through CORBA) e) the iGDSS tools. The entire solution is built using Java J2EE technology,

The strong side of the framework and its architecture is the fact that this decision tools can reside on a computer anywhere in the world. They do not have to run on the main server. In this way the availability of the whole system is not bound to the availability of any tool. Each tool's results (which are in fact the containing tool's session's results) are stored on the main server so if a certain tool becomes unavailable the system can still use its output. The main reason for choosing this architecture is to enable any third party entity to build its own customized tool and easily integrate it into the system.

Basically each tool runs inside an iFrame of the main application. It is initiated in a session's context using the tool's specific URL, and afterwards the communication between the tool and the server is done one-way (from the tool to the server) using the webservice that the server exposes for the registered tools. Thus the tool is provided with the entry data and the session participants, enabling at the same time to store the results in XML format. The participants rights during the session are enforced by the server on every results' update.

3. Antropocentrism, E-Acting, Interface

The basic design idea of the product is guided by concepts of Human Computer Interaction and decision support systems. The innovation lays in the way in which the facilitation support is actively assisted by the system based on the users' intentional attitude. Users do not need thorough knowledge about the system in order to use it efficiently. Its goal is to help the decision maker to strongly diminish the effects of its own limits (cognitive, communicative/collaborative, and confidential) and of the enforced restrictions (economic, temporal and implementation) that can be found in the decision elaboration and

implementation. These can be routine limits (the decision maker's tendency to reuse almost the same previously adopted solutions), cognitive limits (one's capacity of storing, processing and creating knowledge and information), economic restrictions (they refer to the costs connected to the employment of decision assistants and external consulting experts and to the coordination and communication within the hierarchical decision team), temporal limits (they refer to the sometimes doubtful quality of some decisions elaborated and adopted under the pressure of the time available for solving some emergency situations or when multiple problems appear simultaneously) (Filip, 2004).

Every independent problem or a certain matter that requires a group of users to take a decision is viewed as a project. It is then divided into decision plans (or a single one) each of them containing one or more decision sessions. As stated in section 2, the participation in the decisional process is done through work sessions, using the tool that supports each session. These are the decision assisting tools mentioned in the previous section and each of them focuses on a specific aspect of group collaboration, such as idea generation, evaluation, organization, exploration.

On a social level iGDSS refers to increasing the transparency, creativity and democratization of the decision making process, means of selecting the participants to this kind of processes, delocalization and decentralization. Therefore, there are three main features that apply to all tools that are already or will be added in the framework:

- *Simultaneous contribution* - meaning that everyone is "speaking" at once, which saves time and increases productivity.
- *Anonymity* - meaning that the identity of each contributor is unknown, so participants tend to feel freer to express their opinions and ideas which are evaluated more objectively.
- *Complete Records* - meaning that at the end of a virtual meeting, there can easily be produced a complete and accurate report of all ideas, comments and vote results in any format. This last task is usually performed by the tool's agent or the tool itself but the user is asked for his' acceptance over the final results.

All these features are considered fundamental characteristics by the framework and are mandatory for the tools' structure.

The system's interface is web-based so users do not need to install a client program in order to use the system. This avoids any inconvenience related to OS incompatibility, network protocol etc, the only necessary thing is to have a computer with a web-browser and connection to the internet. The interface is built using AJAX technology. Most of the time users will attend sessions by selecting URL links received on their e-mail as notifications for any changes or event occurred in a certain work session.

Within a session the participant is met with a help screen which will instruct him if he/she is inexperienced. This help screen is specific for every tool and can be configured by certain users.

Hence, the group is able to appropriate the available technology in their own spirit and not the one imposed by the system designers. This will significantly contribute towards extending the acceptance and understanding of collaborative technology.

4. Intelligent Workflow

In any group decision, the collaborative nature changes as the cooperation moves towards the final outcome and the meeting plan will evolve in time when the group members are able to actively decide the next steps based on the context of the developing action.

In order to accomplish this the framework implements a workflow having decisional sessions as its nodes and uses the Multi Agent System (MAS) to manage them. Because not all actions

belong to a collaborative plan, the workflow and the framework can contain not only group decisions sessions but also individual decisions sessions and simple task sessions. This workflow concept requires that a session's results can be used as input data for another session. Therefore an *iGDSS ontology* is being developed so that each tool/session stores its results in more or less general format and the subsequent session loads them and considers only the fragments that are relevant for it. This fits very well for the default set of tools, mentioned in section 2, because each tool's activity revolves around a list of issues that are discussed upon, voted, categorized etc. If any third party tool has a completely different activity structure (it does not use an item list) and format of storing its results than, in order to be used in a workflow, it must be aware of other tools' result format and provide an set of XSLTs so the server can transform them. In order to easily maintain the system, a XML/XSLT architecture has selected to store and transform the tools' results. If a decisional process has particular aspects in shifting from one session to another, aspects that are not provided by the system, then custom agents can be developed to solve this issues.

The system must adapt to the users requirements and environment evolution (Filip, 2004). Involving methods and tools inspired by the social and behavioral sciences, users have the opportunity to intervene directly in the decisional process, evaluating and learning the consequences of their actions, and improving the practice and knowledge of the group.

The user follows a continuous cycle between plan generating (design decision phases for reaching the common goal) , alternative classification (possible actions courses' evaluation towards the existing context), plan monitoring (estimating the new opportunities implications as they appear), involvement, plan development (plan extension and modification) and plan fulfilling (completing the established decision steps). This will encourage a creative use of the system in order to discover new and efficient collaborative models.

5. Implementatin And Future Trends

iGDSS has been developed at Wittmann&Partner Computer Systems and is on process of implementation for public administration and academic areas. In the next period we expect to finish these implementations that suppose decisional tools development, validation with different user groups and for different decisional problems. In academic area iGDSS is used to build a decisional web-portal with propose of supporting the process of elaborating and evaluation of a research work. With this portal all interesting stakeholders of process can collaborate and use the decisional support from idea generation to final work evaluation. One direct usage of this will be implemented to Lucian Blaga University from Sibiu, for diploma work process evaluation.

Within the DiFac (Digital Factory for Human – Oriented Production System, contract no 035079) research project it is being investigated the way that iGDSS can be used as framework for industrial decisional processes - new tools will be developed and new type of processes will be investigated.

In near future we will open for research community our decisional tool architecture and API to develop new and more challenging models. With this we propose iGDSS as a possible framework for testing and future development for a wide range of applications.

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**Revealing Users.
How To Discover User Contexts And Interests And Apply This Knowledge To
Broadband Innovations.**

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Abstract

Three examples from a program of consultancy and academic work over ten years are discussed to illustrate the benefit of applying ethnographic methods to the creation and evaluation of innovations in online services. The research was conducted for the Australian Library and Information Association, The National Museum of American History, Washington and the Centre of National Research on Disability and Rehabilitation Medicine, Queensland Australia.

The research draws on communication perspectives and methods to gain an in-depth knowledge of the everyday contexts of users. The paper emphasises flexible, multi-stage research designs and gives details about three methods used; Insite Mapping™, observation/in-depth interviews in user contexts and scenario-based testing, also in user contexts.

This presentation argues for close detailed studies of particular user/content relationships as one basis for broadband innovation. It also suggests that knowledge-sharing at the conference may identify Communities of Practice that could intensify the work of COST298.

Internet services appeared as a formative presence and possibility in public life, without the lead time to discuss, theorise and plan for new methods to judge their effectiveness or best uses. The continuing technological and social innovations associated with broadband now call for some sharing of knowledge and wise direction of resources to make the best of what they offer.

My own part in this story has been to build on the experience of research into children and television (Palmer, 1986), then people and telephones (Gillard et al, various) and apply ethnographic methodology to users of Internet services. At first this was in a policy and academic context, then as a consultant. Looking back, what happened was an application of ideas to online communication and to organisations that had been very productive in studying the relationships of audiences and media. In *The Lively Audience* (Palmer, 1986), children's different forms of engagement with television programs within their family context were reported, based on interviews and participant observation.

These methods have since been applied within critical ethnographies of the ways people use ICTs as part of their everyday life. Moores (1996) for example describes the ways households 'accomplish' their viewing of satellite television within different neighbourhoods by

negotiating the 'taste cultures' of different members of the family and their immediate neighbourhood. Silverstone and Hirsch (1992) emphasise the way ICTs are 'doubly articulated', so that they express the particular values of the one family - its 'moral economy' but at the same time open it to the globalising influences of an international market.

In Australia, ethnographic interviews of women's uses of the phone for kin-keeping was conducted by Moyal (1989) and then extended to the use of the phone in family contexts in a program of work of the Telecommunications Needs Research Group (See Gillard, Bow and Wale 1998, 1997, 1996, 1995 and Williamson 1996). As the Internet and mobile phones became part of family life in the mid 1990s this group applied the methods of in-depth interviews, observation and survey to predict patterns of use based on values about controlling or welcoming communication into the home. A separate study placed user activities in the centre of an analysis of the home uses of TV, video, computers and telephones (Singh, Bow and Wale, 1996). Using in-depth interviews and observation this study discovered intricate hierarchies of ICT use, depending on the technologies available as well as family formation and values.

The subject of this paper, 'revealing users' refers to the work of making visible the different forms of engagement of users with the contents and technologies of online environments and applying this knowledge systematically to create or improve them. The use of methods originally designed for mass media foregrounded the importance of research design. The requirements of user research were different with every organisation but with increasing experience and confidence three elements distinguished our approach. The first was gaining the detailed knowledge of their users that people *within* organizations already possessed, often without being aware of it. A structured group discussion, Insite Mapping™, was developed and used for this purpose.

The second element was understanding the communication contexts and purposes that users brought to their engagement with the organisation's services. Interviews in user contexts, sometimes including scenario-based testing, were employed, though we have also used web-based surveys or focus group discussions where the brief required this.

The third element was reporting the rich, contextual information about audiences in ways that addressed the organisation's main purposes and contributed a sense of possibilities for creative or productive work that was grounded in knowledge of actual uses. The design, methods and reporting were adapted to each organisation, revealing its existing knowledge of users and providing detailed information about audiences that had not been visible. The research enabled more strategic use of the organisation's communication resources and could be the first step in a cycle of development and improvement, based on user feedback. In 2002 the Australian National Audit Office commissioned a description of this approach for one of its booklets, 'Monitoring and Evaluating Government Internet Services', part of the series *Internet Delivery Decisions* (ANAO, 2002) produced by that agency to assist managers to prepare for performance audits of e-government services.

This paper is an account of three projects which produced unexpected findings and suggested further innovation. The paper also illustrates the creative possibilities of applied ethnographic research with broadband users. The three projects were:

- Development of an ICT Strategy for the Australian Library and Information Association (ALIA)

- Evaluation of *History Wired* (www.historywired.si.edu) for the National Museum of American History, Smithsonian, Washington
- User Requirements Study for development of a disability database portal for the Centre of National Research on Disability and Rehabilitation Medicine (CONROD)

1. An ICT strategy for the Australian Library and Information Association (ALIA)

Purpose:

In 2001 ALIA commissioned extensive user research to provide knowledge of the ways members and non members perceived the organisation, the services they were using and the future services they were most likely to find useful. The research was designed to gain an understanding of the current perspectives of staff, members and non-members as a basis for developing a detailed information and communication technology strategy for ALIA.

The research was to address the needs of different types of members and non-members, with the expectation that online services would be used increasingly as an element in communications and service provision.

Research design and methods:

The research design created stages of research to define the types of engagement of members with ALIA and how the organisation's products and services supported their everyday work and fitted into their work context. Expectations for the future of current members and especially by students and those entering the profession were sought. Research methods were:

- Literature review
- Insite Mapping™ with staff and with information management students (non-members)
- In-depth interviews with six members
- Survey of individual members
- Survey of institutional members

This research would be used to guide the redesign of their website as a central point of connection, information and membership. An outline of results from the qualitative stages will be described here.

Insite Mapping™ is a systematic process developed by User Insite to 'map' the uses of contents and services, and to describe the different audience groups who are being served. The discussion works from the particular to the general, asking each individual to recount examples from their own experience of user engagement with a particular service or content. The dynamics of knowledge-sharing within the group usually reveal some common experiences of users so their interaction and purposes can be well described. Usually, the discussion shifts to more general issues in the provision of services including 'difficult' clients and all of this information can be used to create or improve online content. The method was developed as a kind of applied ethnography where the members of the group tell their own stories from everyday experience.

For ALIA, the two workshops were designed to give different kinds of information. The staff workshop gave an account of routine contact with members from the perspective of those within the ALIA organisation. The workshop with students had a different purpose. It

explored the ways students saw themselves and their future careers and how this may relate to a professional organisation.

In-depth interviews were conducted with six individuals, carefully chosen to cover the major user groups identified in the workshops. Three of the six people interviewed worked outside of conventional libraries. One student member desired to work in ‘the technology side of information management, technical systems. Not a traditional library’.

Pattern of results from the Insite Mapping™ and in-depth interviews:

An outline of some findings is presented here to give a notion of what could be revealed by these methods and its uses for innovative work.

Staff workshop

Most of the examples given were of members seeking information using the phone or email and a number of the examples described a mismatch between the service ALIA offered and the expectations of members. This provided opportunities for rethinking both services and communication to members. The great diversity of member activities that were described provided a basis for considering alternate ways of offering member services. Much of the activity related to the creation and sustaining of professional interest groups and communities.

One major discovery from the ‘mapping’ of member contacts with staff was the identification of issues that were being handled across the whole office and taking staff time on a regular basis, for example the planning of Library Information Week.

Student workshop

The students in the workshop were asked to envisage their work in the next five and ten years as a context for later discussions about ALIA. Only two of the ten students had a clear idea of where they would be working. In ten years time they felt that the industry would be influenced more by global issues as opposed to local. Globalisation would also affect specialist libraries, which would need to be aware of and work in conjunction with other specialist libraries worldwide.

The students saw ALIA as a key player in providing them with access to a community of like-minded professionals. They preferred ‘natural’ forms of mentoring, where they would meet people they liked and the mentoring relationship would grow naturally.

It became clear as the student workshop proceeded, that students viewed ALIA as an organisation which facilitated relationships between members rather than a single entity which produced information and services. ALIA’s members, rather than the ALIA head office or organisation, were seen as the experts and ALIA was viewed as a facilitator of communication between students and members.

Interviews

The metaphor that was repeated in a number of ways through the interviews was a desire for ‘connection’ with the ALIA organisation, with some disquiet about any lack of active engagement. One person who had previously been very active described herself as ‘worn to a

frazzle' with little time to devote to professional development. This was from the demands of her position, and the complexities of her life. Others gave examples of being 'connected' to a professional group; in person, through online forums or through more conventional communications.

The six interviewees had positive views about ALIA's future and the activities which would make its work more visible and relevant. Half of those interviewed emphasised the importance of engaging professionals from allied information management fields, and informing members of technology and systems developments within the field.

As an exploratory and diagnostic exercise, the workshops and interviews revealed the need to adapt to a changing profession or, as one interviewee suggested, a different kind of professional. The 'new professionals' were likely to be attuned to new practices, technologies and non traditional ways of working in information management. They were likely to be recent graduates but not just younger people.

Discussion:

The qualitative stages of this research created new information about users from a variety of sources, and some common themes between them. The workshop with staff highlighted the importance of shifting from 'on demand' phone and email contact with members to more strategic uses of a website/portal. The student workshop and the interviews articulated the pressures arising in new definitions of information management and global developments in professional practice and network technologies.

The need to re-imagine the nature of the organisation was affirmed in this research and called for an ICT strategy that would make their expertise and resources available, to be shared and applied more widely. ALIA developed an extensive portal of services, including more visible communities and activities as a result.

ALIA's strategy would now be theorised in terms of Communities of Practice (Wenger et al. 2002) – voluntary groups who meet to share knowledge and improve their particular practice – with the ALIA organisation facilitating a community of communities. According to this framework the knowledge resource resides in the network itself and continuing engagement creates social capital through a spiral of developing expertise as well as social /professional relationships.

2. Evaluation of *History Wired* (www.historywired.si.edu) for the National Museum of American History, Smithsonian, Washington

Purpose:

This paper presents the results of an evaluation of *History Wired* conducted at the National Museum of American History (NMAH), Smithsonian Institution, Washington DC, prior to its launch in August, 2001. The creators of the site wanted to present and describe objects in ways that would appeal to broad and non specialist audiences, including those who were not visitors to the museum itself. The innovative nature of the website interface also raised questions about how it would be put to use by different audience groups. It was decided to use naturally occurring groups of visitors to the NMAH itself as the basis for the research. Its purpose was to describe the variety of ways that visitors to the museum engaged with the

History Wired interface and its contents and to seek visitor suggestions for changes or improvements.

Research design and methods:

Methods were designed to discover how users created their own experience from the many possibilities of navigation and content. The research methods were:

- An observation session, where the researcher sat alongside visitors as they explored the website. The observer made notes of actions by participants and noted new content pages. She would answer questions and show features if visitors asked or stayed 'stuck' for some time.
- An in-depth interview, where questions were asked of the visitors about content, navigation, favourite objects, missing features, likely audiences and responses to the name.

Eleven groups of visitors (31 individuals) viewed the *History Wired* site which was in development at the NMAH. Visitors were asked to use the site together for five to ten minutes, and then to answer some interview questions. Observation of their uses of navigation, as well as choices for more information and general movement around the site were noted. Their comments during the session as well as the interview were taped for later analysis.

Participants were selected from those in attendance at the museum at different times of day. The test site was available on a laptop computer, and participants made their own decisions about who would use the mouse. Sessions varied from 13 minutes to one hour, with larger groups taking a longer time. More than half came from other states, or were on holiday or on a school trip.

The following were involved in the research:

- Father and adult son (20s), visiting to follow up father's war experience
- Four friends from college, visiting during college break
- Six 8th grade students (13/14 years) on a school excursion, (2 boys, 4 girls)
- A retired couple and their adult daughter, a teacher
- Mother (40s) and son, (20s) visiting from Texas
- Three 8th grade girls, friends, touring Washington (with school) from Albuquerque
- A couple, late 20s, Washington
- Family of 4 from Texas, first time in Washington. Son 15 or 16, daughter 11 or 12.
- Male college lecturer and former high school teacher, social scientist
- Mother (30s) and daughter, 6th grade
- Two female friends, (20s), health professionals

The observation sessions and interviews were taped and later transcribed. The transcriptions and observation notes together gave a full description of the session, and these accounts formed the basis of an interpretive analysis.

Pattern of results:

In the observation stages, everyone began by moving the mouse across the map. Only one person tested the site by himself; the others were with friends or family. Perhaps as a result of this, comments and talk accompanied the use of the website. The talk was sometimes quiet and directed and other times noisy and expressive. Many unsolicited comments were made about the interface during the observations. From the beginning all the comments were positive, even glowing. Examples were:

That's really neat

This is really something. Very impressive

In three of the sessions, people mentioned they could spend 'a lot of time' or 'all day' looking at the site.

In most sessions, one person would read out the titles of the boxes or images, or they would read them out together. When they saw an image, for example 'Inside the Lone Ranger's Mask', or read a description there was often laughter or personal comment.

The recording of user behaviour was undertaken to reveal the activity of 'audiencing', that is, the audience-text relationships that were formed as people engaged with the site. In this approach, users were defined primarily by their activity and interests, not their personal characteristics. Indeed, it could be argued that the 'audiencing' was a group phenomenon in this study, not an individual one. The following are the distinctive patterns of use that were observed.

Using the mouse to travel left to right across the map, returning to the left and reading across again

This approach mirrored conventional 'reading' and was only observed in one session. As her cursor moved, the user read pop up labels but did not click and explore further images and information. When this possibility was pointed out towards the end of the session, she tried it a couple of times but mainly continued to read the map left to right. The woman was visiting the museum with older parents and was a grade school teacher, probably in her forties. She did not use the Internet at home, only at school in connection with teaching.

Quickly exploring the dimensions of the content, both the surface geography of the map and the information pages behind it

One group of six 8th grade students did this with great enthusiasm and speed, with statements of 'cool!' accompanying their discoveries. The person with the mouse, a girl, began by exploring in circles within the main concept groups, in this case 'Home/clothing' then added selections of keywords at the top. They discovered there were categories within categories. Once the back pages were discovered, which happened after a few minutes, they combined fast exploration of the map with clicking on back pages, and further information pages whenever various members of the group indicated an interest. This group did not find the timeline or zoom features, but when they were told about them late in the session, they were so excited, it began another round of fast exploration.

Careful exploration of the website to answer particular interests

Three of the visitor groups, who were with family members, including adult children, used the site in this way. One example of this was a father and son who looked at the site then discussed an author, Stephen Ambrose, associated with military history. They spent most time on directed activity, selecting the keyword, 'Military' as well as moving around the relevant

sections. They quickly discovered and used the page links in these thematic areas. As they explored the site (the adult son used the mouse), they commented to each other about what they were finding and what they wanted. They didn't find specific information about '101st Airborne', which was what they had come to the museum itself looking for that day but they did find objects of interest to them.

A second family grouping who used the site in a similar way was a school age daughter and her mother. They were remarkable for the intense interest in reading every word of all the information about particular subjects such as the 'Star-Spangled Banner'. They scrolled down to do this. Again, they were unhurried and talked about the subject matter as they went.

Experimenting with the navigation functions

A fourth approach was not guided so much by thematic content or personal interest as by selection of particular functions that people found interesting to use in themselves. One adult son with his mother explored the site mainly using the zoom function, the topic menu on the left hand side and the enlarge function. It took them some minutes at the beginning to find these and use them, but then they enjoyed the interface itself, choosing back pages for familiar content such as Kermit, Benny Goodman and the Gutenberg Bible.

Seeking the visual experience of objects

A fifth approach seemed to focus on inspection of the variety of visual images, yielding a close engagement with the objects. Two women friends in their twenties found the zoom and enlarge features early and systematically viewed objects of interest by reading out the titles in the zoom display, clicking for the information pages, reading the first paragraph (they didn't scroll down) and then enlarging the image. They talked about the objects themselves as they did this.

Discussion:

The different patterns of engagement showed that *History Wired* provided a variety of possibilities for different audiences. Even those who had little experience with the Internet could explore the site systematically, gaining pleasure from the thumbnail images and the labels on the map. The intention of the designers, to provide direct experience of a large number of objects, and to place in the hands of users many different ways of driving their own experience met with very positive responses. Some enjoyed the 'driving' itself while others were more focused on content, or hopped from image to image. This is a feature which is not characteristic of most websites. While the content may vary, based on user selections, sites rarely provide different 'driving experiences'.

There was an immediate engagement with the written descriptions, though most users read the first few paragraphs only. There were no difficulties with the reading, and three groups read all of the text for some of the objects they chose.

The site was very flexible in providing different reading experiences. Some of the functions, such as the zoom, timeline and drop down menu were not used by many. However, they were all used by some, to support their exploration of the site. With confident users, experienced with scrolling and drop down menus, their own purposes or personal preferences for image or written text determined the ways they used the site.

There was one 'bad' feature of the site, and that was its original name, based on a clever pun of 'bites' and 'bytes'. A number of those interviewed objected to the name as being disrespectful or insulting to the nation. This had been entirely unexpected. The name, *History Wired* was used instead.

The website was launched in August 2001 and attracted the largest audience of any Smithsonian exhibition up to that time, judged in terms of press coverage across the United States and website visits. It did indeed create new audiences for the museum and different forms of access to some of its vast collection.

3. User Requirements Study for a disability database portal, Centre of National Research on Disability and Rehabilitation Medicine (CONROD)

Purpose:

With the intention of building an innovative website that provided the information needs of people with disabilities in Queensland Australia, CONROD commissioned a User Requirements Study in 2001. Previous research had established that there was particular need for information in the days and months following hospital treatment. The report was to provide research-based recommendations from a detailed knowledge of the ways people with disabilities were using current databases. There was very little research which discussed user requirements from a customer perspective for a broad range of disability types.

This research sought differences between users as well as common needs to encourage web designers to provide for the various groups within their customer base of people with a disability.

Research design and methods:

Gunela Astbrink of GSA Information Associates worked with Patricia Gillard of User Insite to consult closely with major providers of disability services in Queensland and to design the research. The methods were:

- Insite Mapping with 11 service providers
- In-depth interviews with ten people with a wide range of disabilities to scope their requirements for a new online database resource

The workshop brought together representatives of eleven Brisbane-based organisations. The workshop participants drew on the day to day experience of service providers to describe clients of disability services and their use of a broad range of services. Their comments were invaluable in sensitising the researcher to the variety of requests made by people with disabilities and the importance of human experience and perceptiveness in deciding what lay behind seemingly straightforward requests. The workshop also led to the inclusion of a carer and a disability support person in the interview stage. The following report will focus on results from the interviews.

The interview was conducted in the following sequence:

1. Observation/demonstration where the user showed the researcher what they often did in terms of access and use of disability related information and more general sites.

2. User exploration of suggested sites with disability information and response to scenarios and tasks which were requested by the researcher.

3. General discussion regarding preferred content, ways of searching and other issues arising.

The methods adapted usability testing within the contexts of users, asking them to use specified online databases. It extended this with questions used in ethnographic style research to examine the everyday routines, purposes and content interests of participants. The research was conducted with people with a wide range of ages and disabilities including vision, motor and hearing impairment and Intellectual disabilities.

The interviews lasted from 45 minutes to one and a half hours. They were tape recorded and later transcribed. Structured observation notes were also taken of the user's environment and disability, as well as other relevant features. Ten individuals in Canberra, Sydney and Melbourne participated in the study.

The following disabilities and demographics were included within the interview group:

- Physically disabled
- Intellectually disabled
- Deaf
- Blind
- Carer
- Age range from early twenties to late forties
- Four male, six female

The particular databases to be explored and the tasks and the questions for the interview were designed in close co-operation with Gunela Astbrink. The interviews were conducted in the natural environment of the person with a disability. This meant that every situation was different to every other. Interviewers had to be very flexible, find appropriate places to sit, and suitable ways to communicate effectively.

Both the interview process and the transcription process were much more challenging than in more conventional studies. The combination of sound tape and written observation record were adapted to the circumstances. For example in one interview with a person who was deaf, the interviewer recorded observations by speaking aloud on tape because she was continually writing to the participant, in order to conduct the interview. The participant could not lip read or sign. Recording comments on tape (which were not heard by the participant, and so did not hinder the progression of the interview) was unique to this situation, and quite different to the usual procedure.

The ethnographic approach, which documents unique environments and uses this information as part of the analysis seemed to be a good match with the subject matter of unique uses of databases, which varied according to the person's circumstances and their disability.

Pattern of results of the interviews:

There were marked differences between participants in their experience of the Internet and their knowledge of how to browse Internet sites and conduct searches in databases. This was

further influenced by the assistive technologies they used to gain access to the information and the influence of their disability on the contents they were able to access and use.

Results from interviews were presented in two main ways:

- Case examples which gave a description of individual uses related to the personal context and particular disability of each person
- An analysis of the main findings across all of the interviews

Case examples were used in the full report to describe the circumstances of each of the participants and their ways of using online databases. The case examples showed the unique adaptations that each person made, in using online communications to enhance their access to information and services. The following describes ‘Tom’ (a pseudonym), 24 who has an intellectual disability. He said that while he had a good long-term memory, his short-term memory was not very good. He received a disability pension.

Tom - Personal Background. Tom has used computers since the early 1990s and began using the Internet on ‘December 15, 1996’. He uses it for a variety of purposes. He has his own website, which is connected to a local church, and he has helped others set up websites. Tom has two computers set up at two desks in his home; a PC and a MAC. He usually uses the PC but during the interview used the MAC as the PC was not working. Tom does not use any specialised equipment.

Communication. Tom has a number of email addresses and communicates with people via email and chat rooms. He likes ‘to chat with people’ on the Internet and spends up to 10 hours daily participating in chat room discussion.

Online Information Seeking. Tom enjoys using the Internet and is a very experienced user. He doesn’t often seek information on the Internet, using it primarily for communication purposes. He seems at ease with sites that he knows well. He appears to read well, but missed key information on unfamiliar databases, and was slow at navigation. When Tom browsed unfamiliar databases, he worked through them quite methodically, reading much of the content rather than quickly scanning.

Before using a database, Tom will guess an organisation’s URL. If he does use a database, he will immediately click onto a hyperlink that takes him to a webpage he feels is relevant, rather than taking time to scroll down and read through the search results. Tom looked at a number of websites over the course of the interview:

- Startlife Online - www.start.com;
- Friend Finder - www.chat.com.au
- Chatropolis - www.chatropolis.com
- Australian Football League - www.afl.com.au;
- Community and Information Referral Service ACT - www.cirsact.org.au;
- DIRC Access - db.dircsa.org.au;
- Telstra – www.telstra.com.au;
- Yahoo search engine – www.yahoo.com;
- Independent Living Centre NSW - www.alcnsw.asn.au;

- Centrelink – www.centrelink.gov.au.

Searching. Tom uses Yahoo as his primary search tool.

Database Design. Tom prefers to visit databases that have easy-to-remember domain names and are simple in layout with minimal linkages. He finds multi-layered databases difficult to navigate. He especially likes databases that provide graphics, particularly in relation to products on offer, so he can distinguish between the different models and designs. Graphics help him choose between products. Tom preferred the search results that were listed on the www.alcnsw.asn.au database when looking for telephones, rather than the Telstra database, because it provided images and pricings of the telephones on offer. Tom would also like to see graphics being used with links.

Interview findings

The following is a broad summary of results. The full report detailed experiences of the databases tested, especially search functions, using quotations and examples. Three headings were used to organise the presentation of results: terminology, content and design.

For over half of the participants, the effect of the Internet had been profound and rewarding. Comparison across the interviews revealed widespread uses of the Internet for searching out information about disability and medical issues, accommodation and travel. However, the disability databases explored were not very useful for accommodation and travel. Participants used a combination of browsing and searching, usually beginning with a scan of the first page opened. They especially appreciated sites where the approach to information made sense to them or seemed ‘natural’.

In response to the usability tasks they were asked to do, most used the search engine Google and were experienced at conducting searches and guessing search terms or even urls for organisations they chose to visit. However, participants varied widely in their practices of choosing broad or narrow search terms and success at searches was very uneven. This was partly due to the great inconsistencies between databases.

The content needs of different disability groups were found to vary, with people who were deaf or intellectually disabled wanting simple text, with explanatory images and pictures carrying much of the meaning. People who were blind or physically disabled, on the other hand, liked detailed information, especially if it were unavailable from another source. All participants benefited from a simplified structure which clearly prioritised information and gave good contextual clues and information about where users were in the database, and where they could move to.

Use of different and confusing terminology by databases was one of the most important issues to emerge across the study. This was even for the search function, which was labelled ‘find’ in one database and therefore missed. For people who were blind, spelling which is a play on the sound of words was particularly misleading.

Participants accepted terms such as ‘physical disability’ to designate information relevant to their own disability. However, some terminology offended them. Karen, for example was unhappy with the use of the term ‘access’, and much happier with the term ‘enable’:

...they haven't thought much about it. I mean it's [access] an obvious thing that you don't have. People don't understand when they stick that label on it, I don't think, because [they] don't realise how much access you lose. ... They're only giving you access to this little tiny pie anyway.

Discussion:

One of the unexpected findings in this study influenced a change in thinking about the scope of the project. Interviewing in the homes or work spaces of participants made clear significance of the Internet for communication between people with disabilities. This was used especially for discussion of medical issues or travel, and to check on government entitlements and support. The website that was developed on the basis of this study broadened its focus as a result, adding a Discussion Board to facilitate such communication.

The basis for making evaluations

In the three examples discussed above the basis for making evaluations of ICTs has been the knowledge of patterns of interest and use gained from close study of existing forms of engagement in user contexts for those contents/services being evaluated. More conventional, quantitative methods such as web statistics or online surveys can be used in a multi-stage research design. However, contextual detail provides the most important knowledge base for evaluating ICTs and online services.

The implications for the future design of broadband services

Studies based on ethnographic research are unique to their context, content/technology and time. This directly challenges the assumption that universally applicable methods that provide direct comparisons between different broadband services should be the goal. Instead, we should begin by looking at the dynamic interplay between particular users and services as the focus of research. The contribution of this paper has been to describe studies that apply this approach and to suggest the ways they can be used as a basis for innovative broadband services. New kinds of knowledge are likely to be discovered when researchers are seeking users' own perspectives. If this is reported in their words and related to particular interests, it is more likely to suggest unexpected directions for future design.

Directions for future research

A major influence on the methods described here has been the writing about knowledge-sharing, Communities of Practice and innovation (Wenger et al, 2002). This conference is seeking to generate innovation in research about broadband by sharing knowledge across researchers, countries, technologies and academic representatives. We form a possible Community of Practice or multiple communities and may benefit from defining the major approaches emerging at this conference and their particular strengths and contribution to development of broadband societies. The communities could form and continue application of their knowledge while making links with adjacent communities. According to the theory this will intensify expertise in each distinct area and create innovation in the contact between them.

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The Question Of The Embodied User Facing The Web Praxis: How To Make A Body In A Virtual 'Biosubjectivity'?

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Abstract

How does the user manage an “embodied” identity in the Web case? How can we understand the links between body and identity build in the relation with the Web? The paper will study those questions in trying to clear up the problems related to body, embodiment, subjection and identity. Therefore, the case of Web produces some specificities: user, facing the Internet, is in a position of inaction: sitting in a chair, he only watches the screen and activates the mouse and the keyboard. We can compare this static position to an immersion of the body in a virtual and immaterial world, as the body was extended by that virtual reality. User’s body is investigating the virtual interface, until it becomes the nodal point between virtuality and reality. We will explore the concepts of Body without organs (Deleuze & Guattari) and biosubjectivity (Andrieu) to understand those contexts of virtual world. Finally, we will extend this theoretical approach to a further analysis of what Deleuze called the societies of control, following the societies of discipline.

How to make oneself a body in front of a computer, surfing on Web? What does it mean, to have a body, and from there, a subjectivity, in the virtual space of Web where the identity owes be negotiated again and again?

We will speak first about the embodiment, and we shall define this one in an immanent centring, that does not force us to a definition of the body, and the embodiment, as an object or a substance. The Body without Organs - that we shall understand at first as *a limit of the lived body* as the body goes to it when it is crossed by affects or by becomings - of Deleuze and Guattari will lend us assistance in this practical meaning of a word of the embodiment, and we shall see how the proposition ' To make oneself a body ' takes its sense in a theoretical approach of the representation of the body as inventor of biosubjective standards (according to Bernard Andrieu ¹).

This first part will lead us to consider the context of Web praxis to propose the body as virtual biosubjectivity. This understands a process of deterritorialization and ceaseless reterritorialization between a virtual Body without Organs, registered in the smooth space (or haptic space) by the worldly virtuality of Web and the stratifications produced by the biosubjectivals and biopoliticals standards.

Finally, we shall carry this proposition towards the strata that the contemporary society settled as sediment and that Deleuze called the societies of control. Indeed, the biopolitics, arisen

¹ Andrieu, B., *La représentation du corps, inventrice de normes biosubjectives*, www.staps.uhp-nancy.fr/bernard/docpdf/normesbiosubjectives.pdf

from a disciplinary society, go to a reorganization of its foundations in the new contexts of surveillance, video-surveillance and Ambient Intelligence.

1. Embodiment ('To make oneself a body')

We choose to consider the body neither as a substance, nor as a transcendental value attached to this substance. Our first option is that the body is involved in a whole of practices, and not as an essence, an object, in opposition to the substance, the soul or the spirit would unceasingly come to be opposed. Not at all, to have a body, to make a body, it is to be implied in an assemblage of *practices*, movements. It is to learn to be affected, to be moved, put moving by other entities, human or not human.²

The body, considered as an object or a substance requires a theoretical discussion from an holist or dualistic point of view, in which we will not enter here. The body, escaping definition of a substantial type (the question of what is the body by *nature*) enables us to considerate it as a 'interface' which would become increasingly describable when that interface learns how to be affected by various elements, human as nonhuman. We do not give a sense to define the body as an essence or a substance, and it is not either the residence of something of superior, as such as thought or soul.

It is necessarily, in our optics, to make a body, to create it, to try it out and insert its own subjectivity there. It is from an active point of view that we conceive it, 'in process' with the world, which surrounds us, populated of human and nonhuman.

How, consequently, to consider the body requiring at the same time the externality of human and nonhuman, and at the same time a whole of practices to be understood as affected? About which types of practices do we discuss?

Actually, the contribution of Deleuze and Guattari, who proposed the concept of Body without organs, could be useful for us. What is a body without organs? Initially, it should be not regarded as a concept, but as a set of practices.

*It is non-desire as well as desire. It is not at all a notion or a concept but a practice, asset of practices. You never reach the Body without Organs, you can't reach it, you are forever attaining it, it is a limit.*³

Then, BwO is not the opposite of the organs, but the organization, i.e. 'the organic organization of the organs', which must be understood like the strata, stratifications imposed by the standards, connections, normative transcendences organized, social and political formations.

*Dismantling the organism has never meant killing yourself, but rather opening the body to connections that presuppose an entire assemblage...[...] You have to keep enough of the organism for it to reform each dawn;...*⁴

The organism, it is not organs on a body. Organism, it is coding or combinative (it is even in the sense that one will speak about a genetic code), organs on the body without organs. The organism is a stratum. The strata, it is a species of formation on the body without organs, which will involve it, to fold back itself, to yield, to form bi-univocal relations. The body without organs taken in a strata yields, is folded up, form a folding back, which produces standards and regulations. Therefore, the first stratum is the organization. The strata of organization is very simple, it consists in making with the body without organs an organization, we organize it according to the principle of the output of the useful energies, for example, of energies of work. The strata of organization take in account what occurs already

² Latour, B (2005), *How to talk about the body? The normative dimension of science studies*, in *Body & Society*, Special Issue of Bodies on Trial, 10, pp. 205-229.

³ Gilles Deleuze et Félix Guattari, *A thousand Plateaux*, Minnesota University Press, 1987, p. 149-150.

⁴ Ibidem, p. 160.

on the body without organs in a system, which will direct it in an other direction. It will divert it.

The second strata, are the strata of significance. The third strata, that one of subjectivation, can say that there is no reality dominating without a point of subjectivation, and this point is not at all the point where the subject emerges, it is the point from which is organized the angle of signifiacnce and the variable opening of this angle. It is always starting from a point of subjectivation that the division of dominating realness is made, and it is always starting from the point of subjectivation that the machine of significances will take place, and then, the machine of organization. There is no organization of an organism, no significance of significations, no determination of a dominating realness without a corresponding point of subjectivation.

The BwO is a practice of perpetual tension; it is a process, an experimentation. That means that one is always making a BwO, there are not a completed process. The immediate effect of the body without organs, that makes only one with the experiment, the experimentation of a depersonalization. The BwO must be understood as a biosubjective constitution of the body, which would raise of a process of singularization of oneself counters domestication representational of the social formations. In other words, undifferentiated and not stratified, the body without organs brings to the idea of a subject, which is spread out over the circumference of the circle from the center, which the self has deserted.

Between the BwO and the stratas or sedimentations, effectuating movements of ceaseless deterritorialization and reterritorialization, it proceeds tensions: we can consider sedimentations as standards, here biosubjectives standards, on whom are tested experimentations, deterritorializations and reterritorializations of the BwO. I will name that tension, borrowing the term from Bernard Andrieu, biosubjectivity.

What biosubjectivity⁵ ? The subjective representation of the self defines a body standard of liveable while allotting to the judgement on the form and the matter of the aesthetic and functional criteria: that means that the body itself becomes a producer of standards for itself.

Normally is not only any more incarnated in the subjectivity (understood here as a mental metaphor), but in the body matter, it is even incarnated in the subjectivation. To take again the terminologies of Deleuze and Guattari, I will say that the movements of deterritorialization that produce virtual BwO settle as sediment strata of subjectivation.

It is necessary to understand the body as producer of biosubjectives standards - and in that point Andrieu and Deleuze & Guattari meet themselves -: the biosubjectivity is the tension which is born between virtual BwO from haptic space and the biosubjectives standards.

More classically, it is a new form of body subjectivity, which wants to be carried out in the biomaterial matter of the body. Biosubjectives from our constitution, it is from now on consciously a realization this biosubjectivity in the matter of our body that is aimed. The 'biosubjectivity' is a setting in culture of the body: the body is not only anymore the cultural object of the subject, but the identity matter of the self, mobile and alive.⁶

The invention of the body by the subject initially was a conquest of the feminists, the gays and lesbians, patients, immigrants, prisoners, disabled people: the right to have its own body testifies to ideological fights, of desires of marginal modes of existence. They are instituting

⁵ Concept of Bernard Andrieu, notably in *La représentation du corps, inventrice de normes biosubjectives*, op.cit. et *Somaphore et corps biosubjectif*, in *Multitudes* n°14, Philosophie de la biologie, Ed. Charles Wolfe, p.59-69.

The term biosubjectivity remains obviously the foucauldian concept of biopolitics, which is built all along his works. For an achieved historical panorama of the biopolitics, we refer to that very relevant paper of Bernard Andrieu, *La fin de la biopolitique chez Michel Foucault : le troisième déplacement*, in *Le Portique, Foucault, usages et actualités*, pp. 190-203.

⁶ Bernard Andrieu, «Faut-il respecter le corps humain ?», in *Le Portique, Le Respect*, mis en ligne le 15 décembre 2005. URL : <http://leportique.revues.org/document553.html>.

biosubjectives standards, in resistance to the shapes of normative domination of the social body, lived like ideological by the minority modes.

We can take as example the cyborgs of Haraway⁷ who legitimate the existence of these biosubjectives standards. Haraway says that because we have already accepted that the technologisation of our bodies through the intervention of medical science – immunisation, pacemakers, transplants, ultrasound, the human genome, etc. - we are already biotechnological beings. We are cyborgs, cybernetic organisms.

2. A virtual biosubjectivity

Which type of biosubjectivity is built in Web practice? How to renegotiate its virtual identity as a body, as a body matter? It is the questions that we will try to answer in this second part.

The interrogation on the identity compared to the identification with the alive body thus comes from the body lived, reflected, informed and asserted, from now on, a biosubjective construction of self, like process in constant movement of deterritorialization and reterritorialization. The BwO that meets the virtual space of the Web is particular: it lives in the smooth space of the Web praxis. Smooth space, haptic space or nomadism are also concepts of Deleuze and Guattari. Mireille Buydens⁸ confirms us a very relevant vision of smooth space to think the space of the Web.

The concept of space smooth constitutes a particularly fertile model to think various contemporary phenomena characterized by a valorization of the dissolution of the borders and structures, fluidity, not planned and the spontaneous one. In this direction, it is an excellent tool to conceptualize cybernetic space. Doesn't Internet function indeed precisely like an adirectional space, non-polarized and not cartographic, where the images are tied and untied on an also close level? Doesn't one speak besides about surfer on the network, as one sails with the liking of the waves, slipping without compass on the dust of pre-formals pixels? The Net surfer is a nomad, controlling at sight in the proximity of the pages, without possible prospect. Also Internet is space smoothes par excellence, like spaces intoxication and of fata morgana, as full and vacuum to him as the Sahara, also near and also plugging. Striated space would be then, on the contrary, the paradigm of the traditional media, with their linearity, their construction, their depth and their setting in prospect: the readable orography of the vision moved away, reflected and panoramic, opposed to the pervasive proximity of the haptic vision in smooth space.

The virtual BwO of the smooth space of the Web, how to build it? If the Net surfer is a nomad, it creates a subjectivity in a body which is expressed only in one static of the screen, the keyboard, the mouse. We are far, in this position, to believe in the nomadism of the e-user registered in a biosubjectivity. However, he can make a BwO, deterritorializing himself and reterritorializing himself in this non-tangible space.

The forums of discussions invites us to the pseudonyms, the webcams to the dressing-up, the role games in network to the creation of a narration of a protagonist in which one can believe, one can steal an identity of player to another, divert it, cheat, etc.... The e-users are done of BwO virtual of all kinds, they try out, follow lines of flight, take along, then create for themselves identities, without being affected in their majority identity.

In what that does affect our body, our embodiment? The answer is very simple and joins the assumptions of Bruno Latour⁹ about the body. It is because our body is affected, is touched,

⁷ Haraway, D., 1991, *Simians, Cyborgs and Women: the reinvention of nature*, Routledge, New York.

⁸ Mireille Buydens, « Espace lisse / Espace strié » in *Le vocabulaire de Gilles Deleuze* (sous la dir. Robert Sasso et Arnaud Villani), Les Cahiers de Noesis n° 3, Printemps 2003, pp. 134-135.

⁹ Latour, B (2005), *How to talk about the body ? The normative dimension of science studies*, in *Body & Society*, Special Issue of Bodies on Trial, 10, pp. 205-229.

put and moved onto this Web world, to which we take part, in which we surf, that we are making a biosubjective body. Our biosubjective body belongs to the Web, as much as the Web belongs to our biosubjective body.

3. From an embodiment towards a virtual biosubjectivity: considerations about the society of control

We could widen the concept and wonder how this biosubjectivity works beyond a 'restricted' and personal virtual space (the e-user in front of its screen as a model). Indeed, the invasion of ICT's in the contemporary societies takes several forms and invades our every-day-life. We assist, often without none possibility of contesting, to the growth of a multiplicity of ICT devices, presented almost as *natural* and necessary objects or needs.

The policy representatives often promote that ICT's development, and try to encourage their acceptance inside the society. A recent example is the case of the new technologies raised by the projects of Ambient Intelligence (AmI) and their visions. The AmI is a notion of computing engineering including a set of technologies sharing common features. The European Commission, through the 6th Framework Programme, supported largely the developments of those new pervasive, ubiquitous technologies. AmI results from the convergence of three domains:

- *Ubiquitous Computing*, who consists in integrating microprocessors into the objects of the every-day-life.
- *Ubiquitous Communication*, who allows these objects to communicate between them and with the user.
- *Intelligent User Interface*, which allows the users to control and to interact with these objects in an intuitive way.

The AmI promises us a world strewed with small electronic, cheap, interconnected, autonomous elements, sensitive to the context and having certain degree of intelligence, all this in our daily environment (in our cars, in buildings, in trees, in the streets). Their utilities would be multiple: from the prevention (from fires, accidents) towards the assistance (guide, control at distance) by way of the comfort. One of their high quality would be their total transparency: they would be present, but completely invisible for us, the interaction with them that must be also transparent. One of the applications of the Ambient Intelligence is 'to make a couple' with the devices of video surveillance. These control mechanisms would thus be strengthened due to the invisibility and the intelligence of the technologies AmI, and it would contribute to make the social control more dependent on technological artefacts.

Foucault has showed in which the disciplinary devices of Panopticon contributed to lead a control of human bodies envisaged as mass ¹⁰. However, the concept of biopolitics is a concept fundamentally static and a category fundamentally historic. It is connected to the history of the disciplinary societies that took place in 18th and 19th centuries, with their highlight at the beginning of the 20th century. They proceed with the organization of the big circles of confinement. The individual passes from a closed environment to another one, with their owns laws: at first the family, then the school, then the barracks, then the factory, from time to time the hospital, possibly the prison, which is the environment of confinement par excellence. Already at the end of the World War II, we were not living anymore in these societies of disciplines; we pass in another shape of society, which Deleuze named 'society of control'.

We observe, following Deleuze in his article *Postscript on the Societies of control*, the passage of a surveillance centred to the human body (it is the modern biopolitics) moving

¹⁰ Notably in Foucault, M., 1975, *Surveiller et punir*, Paris, Gallimard.

towards the control of the virtual identity, and from then of its subjectivity and virtual biosubjectivity.

The conception of a control mechanism, giving the position of any element within an open environment at any given instant (whether animal in a reserve or human in a corporation, as with an electronic collar), is not necessarily one of science fiction. Felix Guattari has imagined a city where one would be able to leave one's apartment, one's street, one's neighbourhood, thanks to one's (dividual) electronic card that raises a given barrier; but the card could just as easily be rejected on a given day or between certain hours; what counts is not the barrier but the computer that tracks each person's position--licit or illicit--and effects a universal modulation.¹¹

To understand why the contemporary biosubjectivity is connected to the society of control, we must evaluate once again the concept of biopolitics. The production of subjectivity, which was determined by the biopolitics, was still a production of subjectivity, in that case, almost always neutralized. The enormous foucauldian effort to bring back the networks of biopolitics to the determination of the subjectivity never ended. It is a theoretical lack that we may fill in. Several things could be underlined to understand the societies of control. First, from the dispositives of surveillance points of view, the panopticon of Bentham is 'rhizomatizing'¹², it means that it bursts his unique eye in a non-organized eyes multitudes. For example, a downtown area stuffed of CCTV does not obey only one supervisor-agent, but it also obeys a multiplicity not organized of supervisors behind the cameras: representatives of the city itself, tradesmen, and unquestionable particular. Moreover, other eyes can record as video amateur by familial cameras, mobile phones, and become another eye or surveillance in the case of security needs, for example. This bursting has several consequences: we can observe a reinforcement, on the one hand, of the dispositives of the data collected and monitored, and on the other hand, of the processes of data protection, which involve an unlimited and perpetual movement from the causes towards the consequences. Indeed, because of the incredible quantity of the data to be collected, monitored and protected, it is necessary to control more and better, and reciprocally, it is because control is invading and omnipresent that we must take care of us as a person.

Therefore, Deleuze says that if in the societies of discipline, one did not cease passing from confinement to another, in the societies of control, the environment itself acts as a distorting universal. What is essential in the societies of control is the exercise of power as massifiant and individuante at the same time (it is biopower or biopolitics), the signature indicates the individual, and its number (of national register, of identity card) indicates its position in a mass. In the societies of control, the essential is not anymore an administrative numeration or a number, but a code. The numerical language is made of codes, which give access to information: one is in front of samples, data ad infinitum, in perpetual growth. The individuals become 'dividual'. The biosubjectivity is folding into the codes and can profit from them to build it.

It is thus following the foucauldian and deleuzian studies in connection with the societies of control that some questions concerning the body are formulated. One can wonder what it means to say, to have a body, in this context of control? On one hand, we can encompass logically the body as passive, subjected to the standards and the normalizations raised by the new dispositives of surveillance. Nevertheless, the new productions of subjectivity, notably the one related to the biosubjectivity, make us hope that those ones are producing new forms of resistance, and that the person 'dividuel' can act in that new way of constructing identity, which we called biosubjective body.

¹¹ Deleuze, G., *Post-scriptum sur les sociétés de contrôle*, in *L'autre journal*, n°1, mai 1990.

¹² For the concept of rhizome, see Deleuze and Guattari, *A thousand Plateaus*, op.cit.

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The poetics of delay: mobile media, pervasive technologies and notions of place

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Abstract

In a period marked by the rise of the mobile media and social software, the rhetoric around the prosumer (consumer as producer) seems endless. The shift into web 2.0 user-created content (UCC) overdrive has seen much discussion around the so-called democratising of media. However, this phenomenon has given rise to examples of users being interpellated as ‘consumers’ rather than citizens and one is left to question just how ‘participatory’ these new forms of media are. In particular, projects involving pervasive (location aware) mobile technologies seek to remind us of the growing importance of place and sociality in the politics of participatory media and forms of ‘networked individualism’.

One of the marked features of the Internet is that as a ‘global’ technology its adaptation at the level of the local is far from homogeneous. This is particularly the case with pervasive mobile projects. The growing interest in conducting mobile location aware projects – where participants negotiate the online and the offline – demonstrates perhaps one possible “future” for ICTs; one that is marked by a straddling between online and offline spaces. The role of pervasive mobile gaming reminds us that global ICTs are still very much subject to the contingencies of place. Moreover, despite the tyranny of rhetoric around the hype of ICTs being about ‘immediacy’, these projects evidence that the reality is more about delay.

This paper will explore the immediacy/ delay paradigm of mobile media through discussing some examples of experimental mobile media projects such as collectives such as UK’s *Blast Theory*, UK’s *Proboscis*’ ‘urban tapestries’ project, and Korea’s Art Center Nabi *Urban Vibe project*. These projects are examples of some of the socio-temporal variables that are evitable when outlining the difference between an “imagined future” and a “lived future”. By drawing on examples of mobile media projects, this paper will reflect on how we can conceptualise the “future” of mobile media and its relationship between co-presence and a sense of place.

Place on hold: Introduction

One of the interesting things to note about the rise of mobile media over the last ten years has been its size variations that make Oprah’s perpetual yo-yo dieting seem normal. When mobile phones first graced mainstream in the 1980s they were associated with yuppies and conspicuous displays of wealth as demonstrated in the iconic 1980s film *Wall Street*. Then, as mobile phones were adopted and adapted by youth cultures, the phone shrunk into a complex

creature adorned by user-generated customization from phone straps to sticker faceplates and screen savers. Then, as the phone became more than *just* a phone and started to emanate this century's Swiss army knife, it bloated in size (Boyd 2005: 28). It is with this size change that we moved into an epoch of mobile multimodality whereby convergence became synonymous with contemporary mobility; whether we liked it or not. Along with this rise in multimodality and corporate smoke and mirrors around the so-called user-created content (UCC) comes an antidote – location-aware gaming, often dubbed 'big games'. Here the notion of big isn't so relating to the gadget's gluttonous size but rather more to do with the role of people and the gravity of place in the navigation of co-presence.

Now, under the influence of mobile, pervasive, and ubiquitous technology, games are undergoing another transformation — one that will continue to change how we think about them. Computer-powered games are slipping off the rectangular screens of our monitors and video displays and escaping back into the real world. Imaginary places, constructed from code, are now being represented not just as pixel grid windows into synthetic 3D environments, but mapped onto the actual 3D environments in which we live (Lantz 2006).

As Frank Lantz, a New York based game designer who has been involved in such seminal projects as *PacManhattan* notes, the importance of location-aware mobile gaming – or “Big Games” – definitely plays an important role in the future of gaming.¹ Citing examples such as *PacManhattan*, UK's blast theory, Geocaching, and Mogi, Lantz emphasizes the importance of these projects in testing the notion of reality as mediation. As Lantz observes, the precursors to Big Games and the 1970s New Games Movement were undoubtedly the art movements of the 1960s such as happenings. In this way, this can be paralleled with the trend in contemporary art from 1990s that French curator and critic Nicolas Bourriaud dubs 'relational aesthetics' (2002). As an extension of minimalist notions of the 'death of author' type paradigm, the 'relational aesthetics' artwork is always 'incomplete' without the audience. Frans Mäyrä also pushes the importance of big games (or pervasive gaming) in exploring the psycho-philosophical dimensions of what it means to be co-present (2003). Mäyrä's approach is 'remediated', that is, as Bolter and Grusin argue (borrowing from McLuhan), the content of “new” media is always of older media (1999). One of the key factors that Mäyrä emphasizes is the importance of *context* to provide *content* in an age of web 2.0. It is the significance of context that brings marriage mobility with gaming. As Mäyrä observes,

Mobile terminals are by their nature context-aware: the service provider gets information both about who the user is and where she is. That kind of contextual information is at the core of all traditional games, but has mostly been missing from digital games. The game that is relevant at the football stadium is different from the game designed for the children's bedroom. If the player is an old lady in her seventies, the game should probably be a bit different from

one for a player who is sixteen. The current generation of digital games is not adaptive in this sense – taking a space shooter or an ice hockey simulation, the game product is always the same, no matter who you are or where you are. The next generation of mobile games will be a bit different (Mäyrä 2003).

The significance of context to inform types of culturally specific notions of game play has not been lost on the global gaming industry. For example, the success of Korean MMO's has been ensured by the government support (Korea is the most broadbanded country in the world, OECD 2006) and the corporate introduction of *PC bangs* (PC rooms) that function as a 'third space' between work and home (Chee 2005). The uptake of certain types of game play and aesthetics can be noted in the adoption of certain games in specific cultural contexts. For example, the playing Korean MMO's games such as *Lineage*, rather than Japanese games, in China and Taiwan are overtly tied to socio-cultural politics and associations with the games' nation of origin (Chan 2006). As Mäyrä notes, in the exploration of the location-aware gaming there are two oppositional possibilities. One, the utopian, sees community-driven and open source projects being established and maintained with surprising results; the other, the dystopian, sees indivisibility between 'the game' and 'reality'. As Mäyrä cautions,

It now appears that in order to understand the principles of the design of mobile pervasive games we first have to study ourselves. What is reality? How can we create and maintain multiple worlds or realities simultaneously in our minds, and negotiate between them as we cross from one context to another? How much of such multitasking can we tolerate and even enjoy before the associated cognitive demands change from refreshing and stimulating into stressful and confusing? Research into the ethics and information ergonomics for pervasive mobile games is still at an early phase, but it looks like the investigation into the future of entertainment will yield some important lessons about human nature (Mäyrä 2003).

For John Chasey, the future of mobile gaming is multiplayer games (2003). As Chasey observes, the first MUD (Multi User Dungeons) games were in 1978 at University of Essex. Whilst Chasey notes the buzz around trying to make "serious" MMOG (Massively Multiplayer Online Games) converge with "casual" mobile games, the reality of MMMOG (Chasey's acronym for Mobile Massively Multiplayer Online Games) becoming anything more than a niche market is unrealistic; especially considering the current costs that would be associated with such an activity and the fact that for many fans of MMOG, the stationary PC – especially in the case of the social space of Korean *PC bangs* – would not be easily replaced (Chee 2005; Hjorth 2006). For Chasey, much of the most creative and innovative games will be in the area of mobile gaming because of the lack of financial expense, corporate regulation and time needed to conceive and complete a game title.

Just like gaming is by nature, as Mäyrä observes, *contextual by nature*, so too is mobile telephony. As one of the most ubiquitous and essential items in everyday contemporary culture, the mobile phone connects us on many levels – from *actual* communication between friends and family to *symbolic* in the form of operating as an extension of one’s identity, signifying modes of lifestyle, cultural capital (knowledges) and emerging forms of individualization. The mobile phone is not just a technology; rather it is a marker of tastes, values and status subject to local nuances; so much so that one could argue that the mobile phone is much more a *social* and *cultural* artifact than ‘just’ an ICT (Information and Communication Technology). As a “domestic technology” (Haddon 1997, 2003), along with telephone, TV and radio, the mobile phone has been dubbed the ultimate form of what Raymond Williams (1974) called ‘mobile privatization’ – the reconfiguring of public and private, being here and there, get reconfigured via modes of technology (Morley 2003). So what is the future for mobile gaming?

If the history of mobile media is anything to go by, when the domestic and personal gets mobile it reinforces the cultural and social specificity of what “home” and “intimacy” entails (Bell 2005; Morley 2003). While the mobile phone may be ubiquitous in many contemporary cultures, it is far from homogenous in its adaptation and appropriation. The history of the mobile phone is also the history of the rise of the empowered ‘user’; much of the mobile phones adaptation by users has subverted industry expectation (i.e. the unexpected high uptake of SMS). As ethnographic studies such as Mizuko Ito’s (2002, 2003, 2005, 2006) in Tokyo and Kyongwon Yoon (2003) in Seoul demonstrate, the mobile phone participates in traditional forms of co-presence and helps maintain – rather than substitute – actual social contact. This makes the mobile phone far from a humble symbol in current contestations about individualism, self-expression and social formation in the politics of everyday life.

The mobile phone has been touted as a symbol of democracy as in the often-sited downfall of Estrada in the Philippines and its pivotal role in the Rise of democracy in South Korea (Kim 2003). As noted in the recent London bombings and the Korean “cetizen”(net citizen) website, the everyday mobile phone user has become a journalist or photo-journalist.ⁱⁱ Does the mobile phone really afford “voice” and self-expression/ representation for the everyday user? And what possible contexts do mobile media present for artists (Davis 2005)? How do the key characteristics of mobile media – mobility, co-presence between the virtual and actual, intimacy, personalization, interactivity and miniaturization – inform its multimodality across textual, visual and most importantly aural discourses? How far should mobile media extend from its initial role as a communication device?

The politics of delay: contemporary constructions of place and locality

If the wireless experience is basically a street culture thing, lived by youth expressing themselves and communicating by any means available, including changing language by

merging visual and text messages, for example, should we – those who are in the art field – feel threatened or enlightened? Maybe what we are seeing is the beginning of a new epoch in which the conventional meanings of the terms "artist" and "audience" are losing significance, not in a theoretical sense, but based on real situations in an everyday context. The potential for wireless creativity and "art" being a critical and creative engagement with the intimate and the everyday context is here today (Chung 2003).

As Eunhye Grace Chung (coordinator of the Art Center Nabi's *Resfest's Wireless Art Competition*) notes in her article on Korean wireless experience, the potentialities of mobile media to challenge conventional relationships between artist and audience, user and producer are endless. Over the last few years, with the shift from 2nd generation to 3rd generation (i.e. mobile phone with internet) there has been much focus on the possibilities of mobile media. As a remediated (borrowing from other media traditions) and yet emerging medium that is now intertwined with the growth of the Internet to encompass social network software (SNS), we are seeing UGC becoming increasingly determined by context.

Practitioners have investigated the dimensions of mobile media through key portals such as "interactivity", personalization, miniaturization, and co-presence (being simultaneously here and there, virtual and actual). Interdisciplinary collectives and incubators such as blast theory (UK),ⁱⁱⁱ Proboscis (*urban tapestries*, UK)^{iv} and hypermedia lab (FIN)^v have sought to explore the role of pervasive mobile technologies; these pervasive mobile projects have investigated the socio-geographical reality "behind" the hype around mobile media's "immediacy" and "intimacy". Collectives such as aware (FIN) and the-phone-book-ltd (UK) have sought to explore the new emerging social, visual and textual genres within the scope of mobile media. Thus we are left to ask – how will the *context* of mobile media inform the *content* art practices? And what will be the dividing line between the 'artist as producer' and the 'user as producer'?^{vi} Is the mobile phone the ultimate Duchampian readymade legacy whereby *context* becomes the key factor in determining *content*?

Location-aware gaming serves to remind us that co-presence has always involved mediation and delay. I experienced this while participating in Nabi's *Urban Vibe* project *Shoot me if you can* (a chasing game involving camera phones and MMSing).^{vii} In this game often I found myself fluffing around with the technology when it would have been easier to catch the other team by hand. But this defeats the point, one is meant to experience frustration, to become even more mindful of the politics of delay involved in so-called immediate technologies. This frustration around abilities, co-presence and time can be found in much of the immediate technologies such as email, texting etc. Delay is intrinsic to the politics of co-presence. Delay is intrinsic to the desire to be immediate. With the rise in the multi-modality of mobile media, rather than freeing up time, paradoxically, users are spending more time (especially under the

umbrella of UCC) than ever before. In particular, in ethnographic research I have been conducting in the Asia-Pacific region in such “techno-savvy” locations as Tokyo and Seoul, users have lamented the “chore” of customising, documenting and sharing the present often results in being unable to experience the present at that moment.

Devices such as camera phone can entice people who have never been interested in photography to take pictures, but they can also make users feel ‘useless’ unless they are continuously participating in mobile media. More and more one feels compelled to document an experience to render special or worthy of collective memories. But, as Lisa Gye notes, this desire to record has its history in the rise of vernacular photography (19th century) and the petite bourgeois rhetoric of writing (or imaging) oneself and one’s family into history (Gye 2005). The conundrum of new mobile technologies is that they are *supposed* to free us up and yet, as a good existential crisis would have it, the freedom is a leash. Work becomes mobile, labour is on a perpetual drip. As the tool of social labour (Fortunati cited in Wajcman and Haddon 2005), mobile media makes us rethink relationships between consumption and production in an age that requires what Misa Matsuda has defined as ‘full-time intimacy’ (cited in Ito 2005).

We are supposed to be available at all times, perpetually connected. Rather than free us, the ‘immediacy’ logic of mobile technologies makes us feel like we must be quicker and must achieve more. On the one hand, everyday users can become creators of images and explore modes of visual expression that are then shared with others; and, on the other hand, users can become trapped in the need to continuously record to legitimate or realize experiences. This conundrum can be seen as the compulsion to feel the *reel* (or mediated) to experience the *real*. As Lev Manovich observes, whilst the analogue may disappear in the age of the digital, the digital perpetually makes reference to, and fetishises, the analogue (2003).

In this force of fast-forwarding present, *presence* becomes *co-presence* as mobile users attempt to record the present that can be savoured and experienced after the moment. This fast-forwarding present means that users are often documenting and sharing *whilst* experiencing; sometimes the documenting mediates the experience so much that users are only able to experience the moment *afterwards*. This was particularly the case with events such as music gigs where users are too busy trying to get the “right” shot that they could only experience it *after* the event. In this way, to be co-present jeopardizes a relationship to the present. In sum, co-presence can often put the present on hold. This is what Daniel Palmer has dubbed as the illusion of ‘participatory media’ (2005).

Rather than saving time, applications such as camera phone image making – and the attendant customising and modes of sharing/ distribution – mean users spend a lot of time sharing and

editing the so-called immediate. The tyranny of immediacy as heralded by the ICTs industry (especially prevalent in the use of mobile media) becomes part of the users' legacy whereby users can spend much time and effort to create a feeling of immediacy and candor. Far from being immediate, these processes are about making time in order to monument a moment that, often for the user, is *less* about a participatory moment and more about a mediated observation. Here, the co-presence between participant and observer, especially with camera phone making and sharing, means users live between the moment and their role to memorize it; thus they experience the moment as both the present and past simultaneously. Connecting intimate gestures with place is the preoccupation of mobile media (such as camera phones) with the increasing need to document everyday gestures and events. It is, as Finnish researcher Ilpo Koskinen notes, a mode that re-territorializes place through partaking in the aesthetics of the banal (2006).

If the mobile phone highlights that *content is contextual*, it is thus subject to the socio-cultural forces of locality. This means that whilst a locative project may be conducted in one socio-geographic space, its re-presentation in another context will produce different meanings and affects. Each time a locative project is performed, the results are different. The possibilities of the convergent multi-media mobile phone have not been lost on new media artists – with collectives such as the aforementioned The-phone-book Ltd, Blast Theory, Proboscis' *urban tapestries* project, Korea's *Art Center Nabi*, Marc Davis and his *garage cinema group* (short movies made on the mobile)^{viii} and Finland's *AWARE*^{ix} – all utilising mobile media as a form for experimentation, innovation and social commentary. These projects have been all attune to the subtleties of place and co-presence, serving to provide a space to contemplate the role of mobile media to reinforce the importance of place and temporality. The importance (by way of its ubiquity and accessibility) of mobile media has certainly taken off overseas as identified by the 2004 ISEA that focussed on wireless experiences and the South Korea's Art Center Nabi, conducting the *Resfest's Wireless Art Competition* (2004), *Urban Vibe* (2005) and *Mobile Asia* (2006).^x

Art Center Nabi has been pivotal in establishing mobile media projects that attempt to question the possibilities and potentiality of mobile media. In the *Resfest's Wireless Art Competition*, Nabi sought to get various International new media artists to make work for mobiles that resulted in little more than screen savers (due to the current generation of phones at that time). In 2005, Nabi had a collaborative group INP (Interactive and Practice) – consisting of artists, engineers and media theorists – working to produce various mobile media projects such as *Urban vibe* in October 2005.^{xi} In 2006, Nabi conducted its *Mobile Asia* competition to get mobile media (content made by or for the mobile) and pervasive projects.

If the 2005, INP project is anything to go by, participants will be reminded of the difference between the rhetoric and reality of mobile media as highlighted by Choi Taeyoon's simulation of a FPS (first person shooter) game in the aforementioned *Shoot me if you can*. However, in this game the gun was replaced by the metaphoric gun of the camera phone (i.e. snapshot as a hunting term) and participants need to take a photo – forwarding it via MMS to the Choi – of opponent team members. The winner is the first to get all photos of the opponents (hopefully not being “shot” by the opponents during the process) in the limited game-play time. As a player (and a *very* hopeless one...) the game was fun; excuses to run around the streets of Myeong Dong (unfortunately while being conspicuously chased by the project's documenter) and behave like an awry avatar. Often there were frustrating moments as one grappled with the technology and its lack of instantaneity. In addition, the game also operated to connect strangers (i.e. other opponents) in interesting ways. It was just a pity that this game didn't have more players, especially “non-art” related participants. This element of disappointment is inevitable in location-aware mobile gaming. It is attached to idealistic projections and its incompatibility with the contingency of reality.

Shoot me if you can, like many of INP's projects, served to highlight the “mediated” and thus far from immediate mode of mobile media in the “face” of f2f contact. This point illuminates one of the many ironies of technology – often technology can get in the way of actual contact; however, it is important to note that intimacy has always been mediated – by memories, gestures and language (Morse 1998). When we send a SMS, we expect the recipient to be “connected” 24/7 and thus delayed response can be taken personally. The mobile phone “sets” us free (to be “mobile”) and yet it becomes a leash whereby people expect one to always be contactable, always “on call”. This is just one example of why Michael Arnold (2003) called the mobile phone a harbinger for paradox as symbolized by the notion of janus-faced (two forces simultaneously pushing and pulling).

This pushing and pulling underscored many of the mobile media projects being officially and unofficially conducted – from the work of Rafael Lozano-Hemmer conducted at the Media Centre in Yamaguchi (Japan)^{xii} and INP to the everyday user on the street. But can mobile media move beyond a study in the paradoxes of ‘immediacy’? Or is the creative potential just a ploy on the behalf of the industry to make everyday users feel less upset about the increasing amount of time taken to participate in the aesthetics of the banal?

In Australia, without a strong local industry (and thus innovation) as can be found in Korea, some media organizations are attempting to get “connected” to the potentiality of mobile media. Media organizations such as dLux and ANAT (Australian Network for Art and Technology), have sought to connect Australian artists through workshops and forums entitled *FutureScreen Mobile*^{xiii} and *Mobile Journeys*^{xiv} including master workshops for Australian

artists to work with such seminal collectives as *The-phone-book Limited* and *AWARE*. The *Mobile Journeys* forums have brought together two foreign worlds in the form of artists and Telcos (Davis 2005). One can't but rethink what is the *art* of being mobile and 'mobile art' for artists in the context of Telco business ecologies. Despite the new mixings between two different breeds – the businessperson and the artist – one wonders whether they are so different in a period of radical conservatism and whether they should be viewed as diametrically ideological opposed; especially as both are supposedly productively focused on the 'user'.

As David Cranswick (director of dLux media arts) asserts, there are 'two significant strands of practice' one where 'content users can "passively consume" on their mobile (like short video works)' and the second, more productive mode focuses on 'more locative and collaborative applications' with users (Hjorth 2005). Cranswick also sees the future of mobile media as an area whereby the two once-distinct groups – users and producers – can be blurred into a new form of indivisibility. This notion of indivisibility between artists and audiences – or, in the case of mobile media, content producers and users – is something that has been pivotal to the experiential work of new media artists in forging the sentiment that 'art' isn't outside of the practice of culture, rather it is integral. While this all sounds good and well, professional artists and filmmakers may be feeling slightly uncomfortable – and for good reason. The interactivity, portability, ubiquity, intimate and miniature device opens up new opportunities but it also open up room for a lot of talentless crap to jam up the storage of content distributors such as YouTube. Is this the final Bretchian moment when audiences become artists and artists become... disenchanted?

Discourse on the possibilities for experimentation have seen many artists and theorists orientate themselves around the role of mobile media as not just a miniature and mobile version of the conventional gallery space. The-phone-book Ltd have explored the emergent genres of SMS, MMS and ring tones to highlight the conventions and codes (compression, immediacy, intimacy) of these remediated and vernacular-driven discourses. For example, SMS poems being poems restricted to the formats of SMS compression (i.e. 160 characters). In Proboscis' *urban tapestries* project, a section of London is navigated and reorientated through mobile location devices, making one recognise that mobile media helps reinforce place rather than destroy it. Here, we are confronted with this century's *flâneur* in the form of what Robert Luke (2005) calls the 'phoneur'; a postmodern *flâneur* who strolls with mobile phone in hand "whilst stalked by corporate hunters".

As Luke notes, the lines between creativity and corporation have blurred in the global mixing pot of the phoneur phenomenon. And yet, the socio-cultural nuances of locality seek to undermine any homogenising of context as presumed under the 'global village' matrix of web

2.0. South Korea, as the most broadband country in the world, is a key demonstration of this by the fact that while government and corporations are pouring money into the digital, users are still very mindful of the importance of contact over connection (Hjorth and Kim 2005).

One the key paradoxes to mobile gaming is that whilst it can develop greater immersion by way of its specific interactive and simulation modes, it can also highlight the inevitable disjunctive experience around co-presence. Whilst pervasive mobile projects are invaluable in geo-caching (such as GPS – geographic positioning systems) and demonstrating the importance of place and specificity in a period of global technologies, they also serve to highlight one of the greatest residual paradoxes of mobile media as a metaphor for socio-technologies. The more we try to overcome difference and distance, the less we do. ‘Undistance’ (Arnold 2003). Or put another way, the more we try to partake in the *politics of immediacy*, the more we succumb to the *poetics of delay*.

Conclusion: Back to the future

Convergence is taking place ... officially and unofficially ... within the same appliances – within the same franchise – within the same company – within the brain of the consumer – within the same fandom ... and across national borders. Convergence involves both a change in the way media is produced and a change in the way media is consumed (Jenkins 2003).

This century’s fin de siècle mantra will undoubtedly be that of convergence. One the dominant harbingers for the convergence binge has been the mobile device, often to the dislike and horror of the user. A case example is when convergence expert, Henry Jenkins went to purchase a mobile phone. Jenkins lamented how his attempts to purchase “just” a mobile phone for “just” voice calling were fraught when he was met by a plethora of convergence-packed devices. But as Jenkins notes, convergence occurs across various levels – technological, social, social, industrial; he elaborates, ‘Convergence alters the relationship between existing technologies, industries, markets, genres, and audiences. Convergence alters the logic by which media industries operate and by which media consumers process news and entertainment’ (2003).

However while convergence might be the name of the game, what are the realities for the everyday user (Kermode 2006)? Location-aware games might be interesting in their phenomenological play but the technological immersive levels are still far away from the reality of the everyday user. The examples of location-aware games have highlighted that far from eroding place, global ICTs – of which the mobile phone is exemplary – are very much subject to the forces of locality. So will MMOG, Chasey’s term for mobile massively multiplayer games, take off? As Bo Kaupmann Walter observes in his apt analysis of

pervasive gaming and the role of networks observes, such games ‘raise questions about the notion of time in games’ (2006).

It is this concept of temporality which is pivotal to the possibility of this convergence, especially considering the ways in which mobile technologies are ‘micro-coordinating time and space’ (Ling 2004) that inevitably resulting in paradoxes. And in the case of location-aware gaming, they rely on an imagined notion of immediacy to which the reality is delay. Arguably, it is this paradoxical nature that needs to be considered as part of the aesthetics and practices of mobile gaming in the future. And this is where its strength, rather than weakness, lies. It reminds players of the boundaries, as well as the nuances, of place. It is also the very inherent contingencies of what constitutes “new” media (Bolter and Grusin 1999).

Thus, in order to comprehend the future of mobile gaming, we need to go back to the future. As Greg Costikyan notes, the only way the future of mobile gaming will succeed is through building an infrastructure for cheap online multiplayer games. Maybe, in this future, theorists such as Chris Crawford (2005) – underwhelmed by gaming’s current lack of luster in interactive storytelling techniques – would picture innovation returning to the discipline. We need to be mindful of the underpinning role of the reel in constructions around the real, we need to be aware of the socio-cultural elements of technology and game play that will see that in an age of convergence, heterogeneous modes of mobile gaming will prevail. Not immediately and certainly with lots of delay involved; a game somewhere between the *reel* and the *real*.

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ⁱⁱⁱ <http://www.blasttheory.co.uk/>

^{iv} <http://urbantapestries.net/>

^v http://www.uta.fi/hyper/index_en.html

^{vi} For discussion of the 'user as producer' model see Danah Boyd's work on the online community of friendster.com.

^{vii} http://eng.nabi.or.kr/project/view.asp?prjlearn_idx=119

^{viii} <http://garage.sims.berkeley.edu/marc.cfm>

^{ix} <http://aware.uiah.fi/>

^x www.nabi.or.kr/, for *mobile asia* see: <http://www.mobileasia.org/>

^{xi} For a review of *Urban Vibe* (in Korean) by the author see: *aliceon* e-magazine:

http://aliceon.net/bbs/view.php?id=archive&page=1&sn1=&divpage=1&category=1&sn=off&ss=on&sc=on&select_arrange=headnum&desc=asc&no=137

^{xii} <http://www.ycam.jp/?lang=en>

^{xiii} <http://www.dlux.org.au/mobile/index.html>

^{xiv} <http://dlux.org.au/mobilejourneys/profiles.html>

Lost in Translation? Users & Digital Archives

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Abstract

This paper examines the challenges users face when searching and using primary sources in a digital format. It details the results of the author's previous study and highlights the main problems encountered by users as they struggle with translating information from this domain.

The author's doctoral research agenda is set out through a series of questions. Each of these is examined in turn along with details of a continuing longitudinal study undertaken in the archive domain. The author's search for a conceptual framework and the study's methodology is well documented in order to provide a backdrop to the development of key areas such as the user's active construction of meaning, the importance of archival context and the creation of a model of contextual interaction.

The areas currently under investigation are presented along with a summary of key findings to date. These areas highlight the application of "user pulled" rather than "technology pushed" solutions and offer an insight into how a deeper understanding of the user can be translated into innovative yet simple design solutions. This "user pulled" approach will ensure a major shift in application from access to use, from simple retrieval to real interaction.

1. Introduction

In keeping with the main objective of the conference, "to create new knowledge about users' creativity and facilitate their empowerment in a broadband information society", this paper highlights the challenges users face when searching and using primary sources in a digital format and examines how "user pulled rather than technology pushed" solutions to these challenges can be developed.

2. So What is The Problem With Using Digital Archives?

Over the past five years there has been a large investment in digital archives but early evaluations have shown that many of these projects have not lived up to the over-arching expectation of "access for all" [1]. The research to date has shown that users continue to find digital archives difficult to navigate and search.

The author's under-graduate thesis involved undertaking a summative user-centred evaluation of a large archival digitisation project [2]. This research resulted in the identification of

several problems areas, three of which provided a particular basis for further investigation; they are summarised as follows:

Search Behaviour: Specific types of search behaviours resulted in varying search strategies which had a direct effect on search results and user satisfaction. Searches that focused on the location of a specific item often ended unsuccessfully.

Navigation: Many users found the site difficult to navigate, with 29% of users stating they did not find the site easy to use. (These users had average or above average IT experience)

Context: The principle aim of the project was to improve access to archives; however 70% of participants stated they would not visit their local archive. It appears the main reason for this was the lack of understanding that the digital object represented a “real” object that could be accessed locally. As users did not associate the digital object with a “real” object, contextualisation of the object within a wider perspective was poor.

These research findings have been echoed across the digital archive environment. Where user-centred principles have been applied in the design process, projects boast a superior interface design; however there remains a complexity in navigation and a difficulty in contextualising the digital object. The author’s initial research led her to examine traditional non-user groups with an aim to designing interfaces that supported their specialist requirements [3].

To extract the information that would facilitate interface design for specialist user groups, an initial study of the digital archive environment was undertaken in order to gain a “snapshot” of the current position. During this study it became apparent that there is a distinct lack of fundamental concepts and models regarding users and how they interact with the system. Having consulted with various user groups, archivists and academics it is evident that the real challenge of digital archives lies in a major shift in application from access to use, from retrieval to interaction. Conceptual models of users and their interaction are seen as pre-requisite in transforming this problem domain. The findings from this initial study led to a revised research agenda.

3. A Research Agenda

The following questions form the basis of the author’s doctoral research agenda:

- **The User:** Who uses digital archives and for what purpose . . what are the motivational factors?
- **The Information Seeking & Retrieval Process:** How do users currently seek and retrieve information within a dynamic digital environment?
- **A Model of Contextual Interaction:** How to model the interaction between the user and the digital archive, capturing the multidimensional context that exists in each interaction?
- **Translation of Information:** How to support the user in translating information to meet their own specific information need
- **The Wider Perspective:** How do the findings from this specialist problem domain fit into the wider theoretical debate within the information science field?

In order to begin to answer these questions a comprehensive study of the domain was undertaken.

4. Collecting the Behaviours of Digital Archive Users

For the past three years the author has conducted a longitudinal study of the information seeking behaviours of digital archive users. The main areas under investigation were:

- How do users with a lack of knowledge search this complex information space and contextualise information?
- How do expert users search this domain and contextualise information?
- What are the common problems encountered by users?
- How do archivists and other information professionals design and evaluate these systems?

The study has encompassed various sites across Europe and North America with the author adopting a multi-method approach to data collection. The primary source of qualitative data was provided via ethnographic observation techniques, supported particularly through individual or group interviews. Web logs, questionnaires and user diaries have also been utilised. In addition to this a series of evaluations has been undertaken evaluating different types of digital archives from a user's perspective. For further details on the methodology used during this phase see Section 9: Methodology.

During the study three main problems continually encountered by users were highlighted they can be summarised as follows:

Where Shall I Look?:

P068: *"I really have no idea where to start this search; I've typed my question in Google and had no joy. I don't know where to look that's the problem."*

What Shall I Say?:

P049: *"I know I'm not asking the right question, I'm just not asking it right as I know the document is there as I have actually seen it. What do I need to type in that box to get the result?"*

What is that?:

P032: *"[laughs] I have no idea what that is, it wasn't what I was expecting put it that way. My goodness I was hoping for a copy of a Birth Certificate of my great great aunt, I now need to decipher all this information. I have no clue where to start"*

These three problem areas encountered by users are a common theme throughout the author's research findings.

Whilst collecting the behaviours of digital users it became evident that areas such as use of language, the use of technology, the hierarchical arrangement of the archive and the archival expertise of the archivist play a key role in supporting archive users. These areas do not neatly transfer over into the digital environment, where the problem is further compounded by deep data structures and an innate difficulty in understanding the representational relationship between the surrogate and the primary source.

P025: *“I know if I was at the archive I could find this document it’s just so confusing when you are sitting here on your own without their [the archivist] help. Look at that . . . what on earth does that mean? You need a degree to understand this stuff”*

The problem with digital archives seems to be that users lack the support of archivists in formulating queries, identifying archival sources and interpreting and contextualising the search results. This is corroborated by a recent survey at The National Archives (England), who reported that 98% of their onsite users find information that is useful to them, once they sought out archival expertise [4]. It makes sense then to examine how archivists mediate the interaction between the user and primary sources, with a view to seeing how this can be translated across into a digital domain.

P078: *“I come here [the archive] to do my research as experience has taught me that I do not do well at home on my own. Some days I will not approach the staff once, other days I can be at the desk six or seven times. They know where the records are and what is appropriate for my research interest. I wish I could transfer all their knowledge on to a computer and take it home with me. They say a lot of this is now Online, that’s all fine and good if you know what it is you are looking for”*

Butterworth states that digital archive use disintermediates [5]. Disintermediation is where the role that the archivists play in supporting users to make the best use of archival resources is removed. He advocates that digitising archival materials and putting them online does not solve this disintermediation, it in fact compounds the problem. He suggests ways of repairing the disintermediation gap through the provision of Online tutorials and annotation stating what the collection can be used for as opposed to the standard archival description

By collecting the behaviours of digital archive users the author hopes that this “bottom-up” approach, based on a deeper understanding of how users actually seek and use digital archival resources will inform system design within the domain and aid professionals in providing services that users require in order to effectively use digital archival resources.

The author’s model of contextual interaction, detailed in Section 6: A Model of Contextual Interaction is based on this “bottom-up” approach and is a direct result of over three years of user behaviour observation. This is one example of how the author has used the rich and multi-faceted data gleaned from the continuing longitudinal study of digital archive use.

Another example will be to provide a searching and retrieval environment that could be easily accessible, actively supporting user orientation and the presentation of contextual information. A recent study by the Arts and Humanities Research Council found that archives, museums and libraries are one of the most trusted information sources, however it was the easily accessible sources, which are least trusted, such as the Internet, newspapers and television that were used most [6].

5. The Users Active Construction of Meaning & Archival Context

What makes searching digital archives different from any other type of exploratory search? The answer lies with the archival context. Primary sources are complex objects; they necessitate contextual interpretation and analysis by the user. This interpretation and analysis requires knowledge of record form by the user, where and for what purpose the records have been kept is a pre-requisite to a successful outcome. Documents cannot be retrieved without

an understanding of their creation and context. An archival document is born out of a function or activity, it has relationships with other document/s, these links or bonds are given a special term in Canada are called the “archival bond”. These links need to be transparent; this relationship to others through the archival bond forms the basis of archival context.

The following quote illustrates this:

“the object itself represents the tip of a very large iceberg: the tip is visible above the water only because there is a large mass of complex social relationships ‘underneath’ it – that generate, use and give meaning to, the digital documents” [7 Rehberger, D. et al (2006)]

For example a professional genealogist will know where all major collections are located. These will contain information that the record was not originally created for, they will have been kept for an entirely different purpose from that of family history. Today these same records may provide a rich source of information to the family historian. So for the novice user, using these types of records will not be readily apparent as they do not have the knowledge of archival sources and of record form to support this.

In a digital format archival context is system dependant, as it is through the system that the user begins to understand and analyse the archival value of the digital object. This need for interpretation and translation by the user is in direct conflict with the whole principle of provenance and archival description i.e. non-interpretation by the archivist. The problem of archival context is further compounded by system provision: all systems are not created equally, some facilitate archival context better than others, a fact which has been highlighted during the evaluation of a number of various digital archives [1]

The author believes that a digital objects meaning is socially constructed through use. Thus one way to begin to understand an object is to understand how people interpret and use the object at a particular point in time. This proposition lies at the heart of the author’s research.

When observing user behaviour it became apparent that users actively construct the meaning of a digital object through a strategy of “translation”. This strategy is one whereby the user has identified an information “gap” and so has an information need. The user is required to define and articulate this need in order to search the digital archive; this requires translation of the information need into language that matches both the archival domain and the search interface. At this early stage many users encounter the problem of “Where shall I Look?” and “What shall I say?” Once the source and language of the search has been successfully navigated the user can begin the search process. This is where a further process of translation takes place, where the context of the digital object, provided by the system, is identified by the user who then distils and transforms this into a format that “makes sense” to them and their specific information need.

If the user cannot contextualise the digital object, the “What is that?” problem occurs. In order to combat this users consistently and almost without fail actively seek out sources of expertise to aid them in translating the information they discover during their search. The sources of “expertise” range from tapping the person on the shoulder who happens to be sitting next to them to seeking out archival expertise via digital reference or through the traditional reference desk.

In effect the translation is an explicit contextualisation of information intended to meet a defined and articulated individual need. The level of expertise required to support the

contextualisation of data has a direct correlation to the perceived complexity of the information seeking task by the user. From the results of the study to date it is apparent that there is very little research being undertaken to discover how users employ this strategy of translation in actively constructing their meaning of the digital object. How users could be supported in this process is a key part of the author's doctoral research, with social computing, discussion forums, online expertise and intelligent help systems all being investigated.

6. A Model of Contextual Interaction

One of the main outputs of the authors doctoral research is a model of contextual interaction between the user and the digital archive, see Appendix 1.

Created as a direct result of collecting the behaviours of digital archive users this “bottom-up” approach is based on a deeper understanding of how users actually seek and use digital archival resources. As Section 7: In Search of a Conceptual Framework, details the creation of the model was undertaken with no primary conceptual model/framework in place; however the author had identified from the outset the concept of Archival Intelligence (AI) as a key concept through which the model could be developed [8].

Based on the AI study there are three forms of knowledge required to work effectively with primary sources and become an expert user they are domain (subject) knowledge, artifactual knowledge and Archival Intelligence.

“AI refers to the knowledge about the environment in which the search for primary sources is being conducted, AI is a researchers knowledge of archival principles, practices and institutions, such as the reasons underlying archival rules and procedures, how to develop search strategies to explore research questions and an understanding of the relationship between primary sources and their surrogates” [Yakel, E. & Torres, D.A. (2003)].

AI can be categorised into **three dimensions**, within each of these three areas, the study has identified characteristics that reveal expertise.

- Knowledge of archival theory, practise and procedures
- The ability to develop strategies to reduce uncertainty and ambiguity
- Intellectual skills

Each of these areas has been mapped across the model of contextual interaction. The concept of AI along with the results of the user behaviour study provided a robust basis on which the model was designed. In order to comprehensively test and analyse the model a guiding conceptual framework was required.

7. In Search of a Conceptual Framework

Allen et al have identified “Global Information Access” and “Contextual Retrieval” as the two great challenges for information retrieval and seeking (IR&S) research [9]. The problem of contextual retrieval in a digital archive environment remains relatively unexplored. The problem the author encountered from the outset was that current information seeking and retrieval models that could be applied to this specialist domain would only capture a small amount of the complex contextual factors that exist in the domain. The model of contextual

interaction had to facilitate the incorporation of a robust user model. The problem was further compounded by the fact that there are no universally recognised user models for this domain. The model would also need to include elements such as user goals and context.

An extensive literature review of information seeking models was undertaken in order to identify key areas of analysis and development, particular attention has been given to Bates [10] Ellis [11] Marchionini [12] Kuhlthau [13] Dervin [14] Yang [15] Vakkari [16] Ingwersen & Järvelin [17] Savolainen [18].

In an attempt to find a suitable conceptual framework the author undertook a comprehensive review of conceptual models across disciplines. Kuhlthau states that collaboration across disciplines is essential for future research [19]. She proposes four imperatives for fostering collaboration and continuing to develop the conceptual frameworks, this research incorporates all four of the points in its long term aims and objectives:

- Stay with a problem long enough to verify findings and draw concepts from the findings
- Apply the broad conceptual frameworks to inform the findings of our studies
- Develop research projects that incorporate concepts of interest to more than one area of the field
- Design application of the concepts for implementation into systems and services

As a result of this trans-disciplinary approach Cognitive Work Analysis (CWA) was identified as a framework to support a comprehensive design and evaluation process [20]. CWA is an analysis that examines the constraints that shape information behaviour. It investigates behaviour in context; individual studies provide results which are applied to the specialist domain under investigation. CWA facilitates this by evaluating the systems already in place and developing recommendations for future design.

On implementing CWA it soon became apparent that a single researcher cannot apply CWA to a satisfactory standard. The same can also be said of Contextual Design(CD) techniques [21] CD is a powerful design tool but many of its processes need to be undertaken by design teams as opposed to a single researcher. Rapid Contextual Design techniques will be implemented later this year with another researcher during the design process for a national virtual archive in United Kingdom.

Discourse Analysis was also investigated as a means for facilitating the analysis of discourses in the archival domain providing a practical insight into how discourses can affect the initial information need, the information seeking process and the resulting use of archival resources. To date there has been similar investigations into the digital library sector [22], but no such investigations have been made in the archival sector. The author decided that this conceptual framework was too far removed from main stream computer science and would be viewed with a certain amount of suspicion.

After nearly two years searching for a conceptual framework that would “fit” this domain, the author attended Information Use in Information Society, Bratislava, October 2006, where Professor Tom Wilson introduced Activity Theory as a conceptual framework for rethinking information behaviour research [23]. Following this and further to a vigorous investigation of Activity Theory and interaction design, Activity Theory was adopted as the conceptual framework through which remainder of the doctoral research would be undertaken.

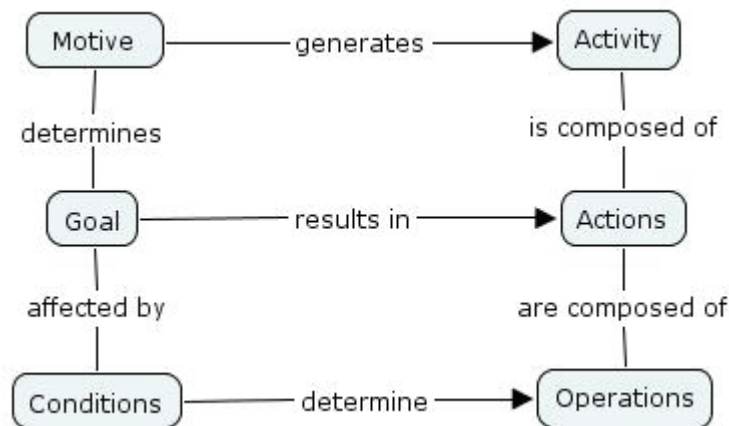
8. Activity Theory & Digital Archives

Activity Theory (AT) is a general conceptual framework; it is not a highly predicative theory. It is a psychological approach based on cultural-historical psychology and was a dominant theory under communism in the Soviet Union. It seems somewhat ironic that the author will talk about the application of AT in the development of twenty-first century digital archives in the place of its birth.

The main rationale for adopting AT is that it focuses on the activities of people using technology rather than on human-computer interaction. This focus on activities enables researchers to extend the scope of their analysis to include higher-level, meaningful tasks.

According to Leont'ev interaction between human beings and the world is organised into functionally subordinated hierarchical levels [24]. He identified three levels Activity, Actions & Operations. Activities, in this research, the interaction between the user and the digital archive, are undertaken to fulfil a Motive.

Fig 1. Activity, Actions & Operations



In AT activity refers to a specific level of interaction, the level at which the object has the status of a motive. A motive is an object that meets a need of the subject, the ultimate cause behind any human activities is needs. The object of activity, which is defined by Leontiev as the “*true motive*” of an activity, is the most important attribute differentiating one activity from another.

“Thus the concept activity is necessarily connected with the concept of motive. Activity does not exist without a motive ; “non motivated” activity is not activity without a motive but activity with a subjectively and objectively hidden motive. [Leont'ev (1978)]

This concept of motive helped the author to crystallise an area of key findings from the longitudinal study. The users’ goals or needs where found to be of hierarchical arrangement with higher level goals driving the user more than lower level goals. For example a user searching for crucial documents to support a legal claim against the State has a higher motivational context than a user who is browsing for details of their family history.

Preliminary findings are indicating that the user’s motivational context may provide the key in identifying “user pulled rather than technology pushed” design solutions. Identifying the motive for use early in the interaction process provides designers with an opportunity to place

the user on a pathway that others with similar motives have travelled and have found useful. The idea of pathways to common sources of information based on the user's motivational context is one which has been well received by a number of national repositories and will be developed over the coming months. It is hoped that taxonomy of motivational factors will be produced as part of this research.

Another major factor in adopting AT was its recognition of a special status for culturally developed artefacts, considering them as fundamental mediators that relate human beings to the world and to human culture and history. The tools usually reflect the experience of other people who tried to solve similar problems before and invented or modified the tool to make it more efficient and useful. This concept of tool mediation plays an important role in digital archives, especially with reference to archival context.

The use of tools within the digital archival domain can be seen as an accumulation and transmission of archival knowledge. In this research technology is seen as a tool that mediates the interaction between the user and the digital object. The emphasis is on the contextual factors that exist in the domain and on the interaction between users and the digital object via their system environment.

Because tool mediation is such an important aspect of AT it also takes into account long-term developmental changes in users, technology, their interaction and the overall context of the domain. Once again this long-term development aids the author in setting the scene for what has gone before in terms of tool development, what has taken place during the study and set the stage for what may happen in the future.

9. Methodology

At the start of the study the findings from a small number of studies were available that had been undertaken to examine digital archive users and their information seeking behaviours [25]. In addition to this a series of six evaluations were undertaken in order to gain an insight into the behaviours of digital archive users and produce a pool of data on which the model of contextual interaction could be built. The result was a large source of qualitative data, produced via ethnographic observation techniques, supplemented through individual or group interviews. To date the study has encompassed over 520 users with a series of 38 focus group sessions and 119 individual in-depth interviews across Ireland, United Kingdom and Canada. Web logs, questionnaires, user panels and user diaries have all been utilised to support the analysis of the data collected to date. In addition to this a process of contextual inquiry has been undertaken in order to understand domain and users mental models, with the production of hierarchical task analysis, domain models and personas.

This multi-method approach to the study has ensured a rich and vibrant snapshot of the domain. It is hoped that this detailed inspection of users and their interaction will yield some suggestions on how best to evaluate digital domains, at present baseline metrics and methodologies that can be shared across digital projects are uncommon [26].

Ax-SNET (Archival eXcellence in Information Seeking Studies Network) [27] As a member of this international group of researchers, this study feeds into the groups over-arching aims which are to improve access to primary sources and explore the ways users seek information in archives. The research group is currently making recommendations on the establishment of metrics that support shared data-gathering and data sets.

The testing and analysis of the model of contextual interaction is being undertaken in a series of evaluations and tests which encompass the following:

- **User Studies:** variety of user types with different motivational factors
- **User Panel:** consisting of all major stake-holders
- **Usability Testing:** including thinking aloud observation
- **Interviews:** both semi-structured & time-line
- **Contextual Inquiry:** to understand domain & mental models
- **Questionnaires:** Both On-line and Paper
- **Web Logs**

The testing and evaluation process is being co-ordinated through the application of The Activity Checklist: A Tool for Representing the “Space” of Context [30]. The application of the Activity Checklist is one of the ways the author has ensured that AT is applied throughout the remainder of the research. One of the by-products of this application will be a robust questionnaire based on the Activity Checklist criteria that can be used by other researchers in this domain. There are four particular areas under investigation at present (Spring/Summer 2007):

How Do Users Use Digital Objects?: A two part study that asks the users on ending a session using digital archives a series of questions surrounding intended use, motivational factors and satisfaction. A follow-up session a month later asks the users how exactly they used the information and if their original goal was realised. To date no such study has been undertaken in the domain ascertaining use, user satisfaction and the users’ motivational factors. This study is to begin summer 2007.

The Formation Process: Do We Need a Helping Hand?: It has become apparent that early intervention will aid the user in problems of “Where shall I Look?” and “What shall I say?”. There is very little low-level help available to users who need this type of support. The author is currently working with two national repositories investigating ways that this could be introduced, including virtual reality and animation, speech interfaces, multimedia provision and visualisation techniques.

User Generated Description: The idea of user generated description makes most archivists very nervous! Social computing may offer alternative ways of providing users with information in a way that requires less specialist knowledge or skills, supporting them in their active construction of meaning of the digital object. Various genres of social computing are currently being tested by the author to see what “fits” the domain best. . The National Archives (England) has launched it’s Wiki to the public this year and the author will be involved in the evaluation of this project.

Expertise Online?: How can we support the user and close the disintermediation gap? Facilitating a range of expertise online is one way to do this, ranging from simple semi-automated processes using datasets to, “ask the archivist” sessions to the application of artificial intelligence agents. Discussion groups and the application of collaborative software are also being investigated. The author is currently working with two national repositories in investigating ways that this could be introduced. As part of this work it is essential to examine how archivists mediate the interaction between the user and primary sources, with a view to seeing how this can be translated across into a digital domain.

10. Key Findings to Date & Further Work

The main findings from the study to date are summarised below along with plans for future development:

Identification of the Three Most Common Problems Encountered by Users: The identification of the three most common problems encountered by users and more importantly at what stage they encounter them during their search has been fundamental to the study, see Section 4: Collecting the Behaviours of Digital Archive Users. Based on this information current archival systems are currently being re-developed to support the user.

Users Active Construction of Meaning of the Digital Object: This process had not been previously examined in this domain prior to this study, see Section 5: The Users Active Construction of Meaning & Archival Context. Having witnessed this process hundreds of times, it became apparent that there are a number of contextual factors that can affect this process. The current investigation of how different types of technology can mediate this process at different stages is one way that the author seeks to expand our knowledge of this process.

A Model of Contextual Interaction: Prior to this study there had been no attempt to model the interaction between the user and the digital archive. The author's model of contextual interaction was introduced to archival professionals at two of their major conferences in England and Canada 2006. It was well reviewed and the author was invited to a number of further meetings in order to discuss its development in further detail. The model is now the basis on which three national repositories are investigating digital archive use. The remainder of the study will be spent testing and analysing the model, both qualitatively and quantitatively; applying the results of the testing iteratively to it. The development of the model is on an on-going process.

Tracking User Behaviors: Since the inception of the study June 2004, there is evidence of major changes in user search behaviors. An example of this is iterative searching; at the beginning of the study users would search iteratively for a maximum of 2-3 times. Today as users are experienced in Google-type search they will search iteratively for 5-7 times. Whilst the search is not sophisticated, with Boolean terms are hardly ever being used, users will change their search criteria in response to search results. As the study of the domain has been longitudinal in nature, such changes in behaviour have been identified and continue to be monitored on an on-going basis. Activity Theory has and will continue to support the analysis of these developmental changes. It is the author's intention to continue to study users within this specialist domain as an element of her post-doctoral research.

Horses for Courses?: The Application of Technology: It has become apparent that different types of technology applied at different stages of the interaction process will be of great benefit to users of all types. Different types of technology such as animation, speech interfaces, and collaborative software social software are all being tested at present to see what effects they have on different types of users during different stages of the interaction process.

The Fruits of a Trans-disciplinary Approach: Working across disciplines such as computer science, archival science, information science, information retrieval, interaction design, HCI, psychology, ethnography and AI has been challenging, however the fruits of this has been a rich and panoramic view of the problem domain. The author has attempted to translate this

into a robust multi-method approach to her research and the application of its results in the domain. One area of planned future development is to emphasise the trans-disciplinary nature of this work by creating a set of tools that supports researchers from any discipline when investigating the use of digital archives.

11. Conclusion: “Still lost in translation?”

To date systems have been designed primarily with archival description and arrangement in mind. Whilst this has proved satisfactory for many professionals, it leaves users lost in a process of translation. So how can this situation be rectified, is there a solution?

Professor of Archival Research at Glasgow University, Michael Moss believes the solution lies in actively engaging with other disciplines that use, handle and exploit information in all its different guises. He states:

“There is nothing to be gained from remaining in an archival gulag except extinction.”

He has witnessed the benefits of this type of collaboration on a visit to the Inter-Faculty Information Initiative at the University of Tokyo which brings together specialists from many disciplines to address a raft of information needs and user seeking behaviours. An interesting feature of this initiative is that it pulls information professions out of their “institutional comfort zone” into the hurly burly of intellectual discourse, forcing them to look at their services from different perspectives and explore radically different technical opportunities [31].

If the archival domain is to respond and rescue it’s users who are lost in translation it needs to become serious about getting to know its users in far more detail. “User pulled”, “bottom-up design” and “user-centred design” are all terms that describe a philosophy of design based on a significant understanding of the user and how they actually use the technology under investigation. This is now widely recognised as a design approach that is more likely to result in high quality, user-accessible systems. The in-depth, ethnographic approach taken in this project is intended to reflect this, but the author has encountered some criticism for adopting this methodology. There are professionals within this domain who truly believe that they know “what is best” for the user and that undertaking real user consultation is a waste of precious resources. However, the author does not support this view and firmly believes that however thorny the discussion may become “user-led” design holds the solution to the lofty aim of “access for all”.

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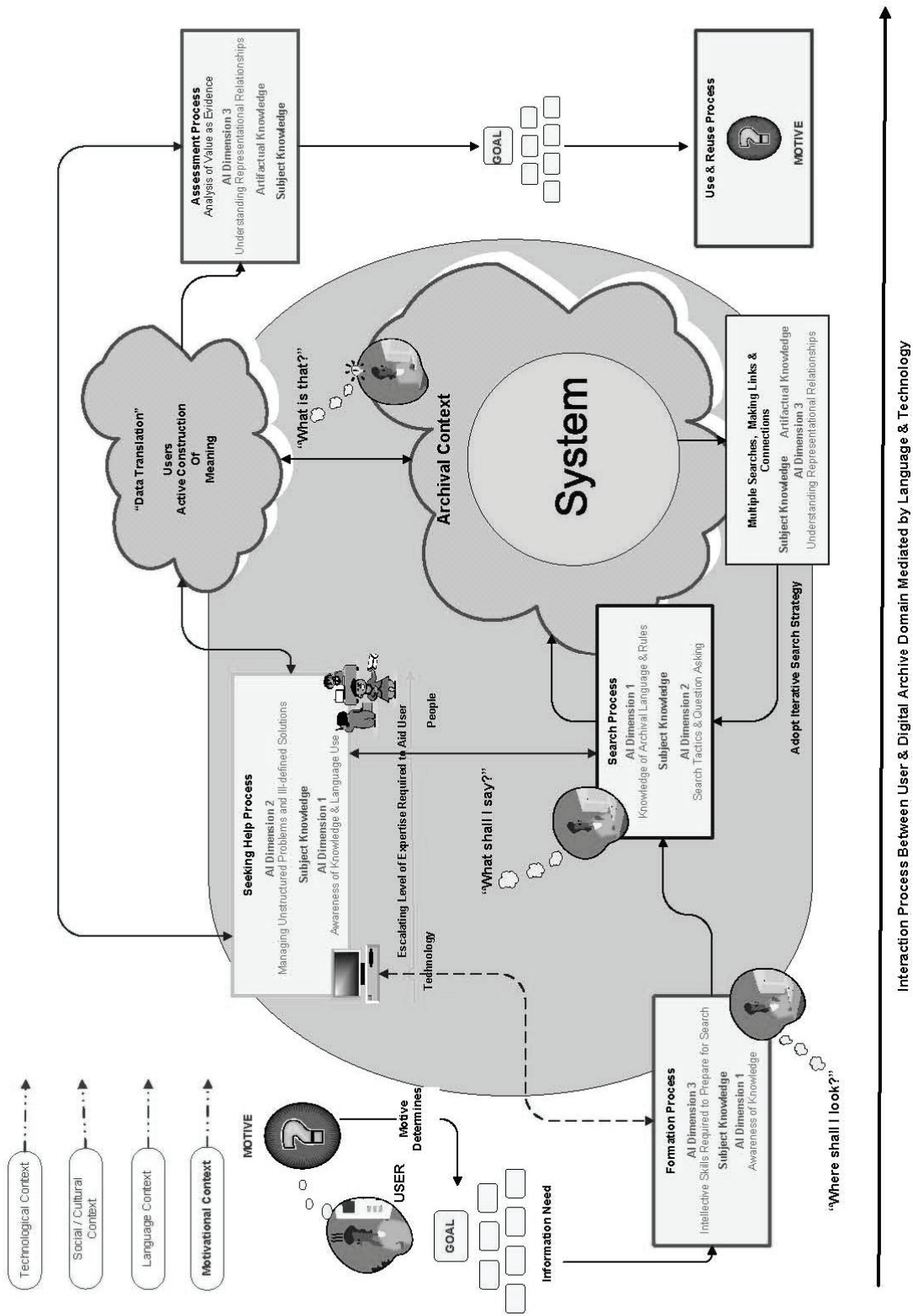
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Appendix 1

Model Of Contextual Interaction Between User & Digital Archive March 2007 (Model 12_00A)



A Patchwork Of Online Community-Based Systems: Can Social Software Be Used To Augment Online Individual Social Capital?

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Abstract

In the first part of this paper I discuss the conceptual differences between *web2.0* and *social software*. I argue that in communication sciences the phrase *social software* is more appropriate than *web2.0* and provide a definition for social software. From there, I develop a typology for social software based on four criteria: contentmanagement, communication, collaboration or community related activities. Each of these dimensions has its own theoretical significance and can be viewed as a key concept in the understanding of social software. Furthermore, these dimensions can be used to visualise types or certain usage-patterns of social software.

In the second part of the paper I explore the relationship between social software and social capital. Social software targets the fulfilment of certain needs (for example the need for online content management) and it tries to do so by means of social, bottom-up processes during which social networks are created and maintained. Social software can widen the experience of community (connecting people with others who have different beliefs or backgrounds) or social software can deepen the experience of community (reinforcing and strengthening existing social networks). This indicates that social software can be used to augment individual social capital.

Introduction

When Windows 95 was introduced on the market some twelve years ago it contained, unlike previous operating systems, a build-in TCP/IP-stack (a software implementation of two communication protocols which enable a computer to make external connections) and dial-up software that made connecting to the internet relatively simple. Some months later, a new Windows 95 service release also included a build-in internet browser (Internet Explorer 2.0). Thus, the introduction of Windows 95 on the consumer market can be considered as an significant moment in time, as a starting point for the consumers' internet.

Nowadays, the internet is an important part of our lives. Online digital information has become ubiquitous and accounts for a major part of the economic and cultural activities in western society. Hence, our society calls itself an information or network society.

A range of quantitative and qualitative arguments can demonstrate this growing significance of digital technologies. For instance, the adoption rate of high-speed internet worldwide furnishes quantitative proof of this. According to the Pew Internet & American Life Project (Horrigan, 2006), adoption of high-speed internet at home in the US grew twice as fast in the year prior to March 2006 as in the same period from 2004 to 2005. In Belgium, the 15th edition of the Belgian Internet Mapping Studies (*Belgian Internet Mapping Studies*, 2006) reports a relative growth of 9 percent (between April 2006 and April 2007) in internet penetration, amounting to an estimated total of 4,9 million Belgian internet users, or a growth of an additional 400 000 users compared to April 2005. A quick glance at our written and oral vocabulary corroborates the growing importance of the digital with qualitative proof. Barely

two decennia ago, internet service providers and software companies had to use metaphors such as *information highway* and *internet traffic* (Stefik, 1996) to represent, explain and promote the internet to the consumer. Today, internet terminology such as *to google*, *to skype* or *networking*, is incorporated in common parlance. Newspapers and other traditional news media try to build a presence online and report upon the internet more frequently. Reuters, for example, recently opened a satellite-office in the virtual game world Second Life in order to begin publishing text, photo and video news from the outside world for Second Life members and news from Second Life for real world readers (see <http://secondlife.reuters.com/>). Still, it may be worth remembering that the web is just an twelve-year old, considering the introduction of Windows 95 as its 'day of birth', and subject to all the angst, mood changes, and transformations typical for a young teenager.

The end of the dotcom-crisis in 2000-2001 marked the advent of one of these transformations, resulting in new and more interactive and participative models of online communication. Today, the internet is going through a major shift in terms of content and services that it supplies. The blogosphere, websites facilitating true user participation and other forms of one-to-many or many-to-many asynchronous communication such as pod casting are on the rise and appeal to millions of internet users worldwide. This recent shift in terms of content and services that the internet supplies, is referred to by phrases such as *web2.0* or *social software*. One of the characteristics which typifies this new generation of internet services is its 'bottom-up' approach. The content and structure of websites is no longer defined by professional information providers but is determined by the users of the websites.

Social software is about the era of social media where people not only consume media-content, but also create it and where community and collaboration are no longer defined by physical proximity but by common interests. Thus, social software, expanding on the social capabilities of web browsing and email, has inherent qualities for creating and sustaining social capital.

As the Dutch media theorist and net critic Geert Lovink (Lovink, 2005) states: "internet culture is in a permanent flux." Web2.0 or social software services arose just recently on the internet and are reshaping the (new) media field. Consequently relatively little research and analysis on social software and its relation with social capital has been conducted in communication sciences. The aim of this article is twofold.

In the first part of this paper I want to signal this gap in academic literature and distinguish and explore the different dimensions of social software based on a qualitative approach. The second part of this paper places social software in the context of social capital and explores the literature on the impact of internet on society and social cohesion. Web2.0 or social software services appear to be evolving into a patchwork of various independent or loosely connected community-based systems, where the synergetic effects that could emanate are neglected and lost. These and other arguments incited several authors to argue that the internet and social software in particular are inimical to the creation of social capital. Others state that an individuals' social capital can be augmented by the use of social software.

I want to provide a framework and place social software more prominent as a research topic for social sciences and communication sciences in specific. Researchers should realise that a clear research agenda aimed at understanding social software is needed. If we want to model communication online; if we want to understand how this technology will be adopted in everyday life; and if we want to investigate the online creation of social capital, then we must draw our attention to social software.

1. A closer look at social software

1.1 Web2.0 or social software: a semantic discussion?

In ‘What Is Web2.0 - Design Patterns and Business Models for the Next Generation of Software’ (O’Reilly, 2005a) Tim O’ Reilly stated seven basic principles that tried to define the common features of new internet applications that started to appear after the end of the dot.com crisis. In a follow-up blogpost O’ Reilly provided a short definition for web2.0 that emphasises the use of the web as a platform. On this platform each user controls his own data and software is delivered as “a continually-updated service that gets better the more people use it, consuming and remixing data from multiple sources, including individual users, while providing their own data and services in a form that allows remixing by others, creating network effects through an ‘architecture of participation’ (...)” (O’Reilly, 2005b).

Although the phrase *web2.0* is quite popular online, the use of the term *web2.0* is problematic on different grounds. Web-developers, venture capitalist, programmers and analysts use the term *web2.0* mainly to underline the technological ‘back-end’ characteristics, such as the use of data-aggregation, micro content and lightweight programming models, often excluding the social characteristics of web2.0. Moreover, the expression web2.0 delimits its range to internet services using the world wide web (a collection of interconnected documents and other resources) and does not take into account other services mediated by the internet (a collection of interconnected computer networks) such as peer-to-peer-file sharing, email and streaming media. Nor does it describe services mediated through other channels such as mobile phones or interactive television. Finally, the important advantage of the phrase web2.0 – emphasizing a turning point for the web by using the postfix 2.0 – is also its major downfall since it assumes a drastic break with the past (with web1.0) but does not explain where this breakpoint is situated. The phrase social software is not laden with these restrictions and is thus more appropriate to describe interactive and participative models of web services such as Flickr, Del.icio.us or YouTube (<http://www.flickr.com>, <http://del.icio.us>, <http://www.youtube.com>).

1.2 The origins of social software

Although the term was already in use before 2002, the word *social software* gained general attention thanks to the Social Software Summit held on the 22nd and 23rd of November 2002 in New York by Clay Shirky. From then on, many definitions about social software started circulating and it became and still is a much talked about subject in the blogosphere.

Christopher Allen (2004) gives a detailed account of the origins of social software and states that the terminology has moved through a life cycle. He sees social software as the successor to computer supported collaboration work (CSCW) and groupware. Bannon & Schmidt define CSCW as “an endeavour to understand the nature and characteristics of cooperative work with the objective of designing adequate computer-based technologies.” (1991, p. 4). Greif (1988) describes the field of groupware as “an identifiable research field focused on the role of the computer in group work”.

This focus on the support of groups per se is abandoned in the conceptual approach to social software. Stove Boyd (2005) even argues that social software will come to mean the opposite of what groupware and CSCW-tools were intended to mean. Boyd argues that social software departs from a bottom-up approach, supporting the desire of individuals, and that this is its main difference with CSCW: “Social software is based on supporting the desire of individuals

to affiliate, their desire to be pulled into groups to achieve their personal goals. Contrast that with the groupware approach to things where people are placed into groups defined organizationally or functionally.”.

1.3 Defining social software

Desk research revealed an abundant amount of definitions describing social software. However, most definitions seem to have a common ground. They all subscribe the importance of creating networks and relations between people. In addition, most of them acknowledge the bottom-up approach as described by Boyd. Clay Shirky and Tom Coates provided significant definitions for social software. Shirky describes social software as “software that supports group interaction” (Shirky, 2003) and Tom Coates defines it as “software which supports, extends, or derives added value from, human social behaviour - message-boards, musical taste-sharing, photo-sharing, instant messaging, mailing lists, social networking.” (Coates, 2005). Using these statements as a starting point I developed a definition for social software which was presented to a group of experts in the field of e-learning, social software and web2.0 in a qualitative survey. The next section briefly describes the methodology and results of this survey.

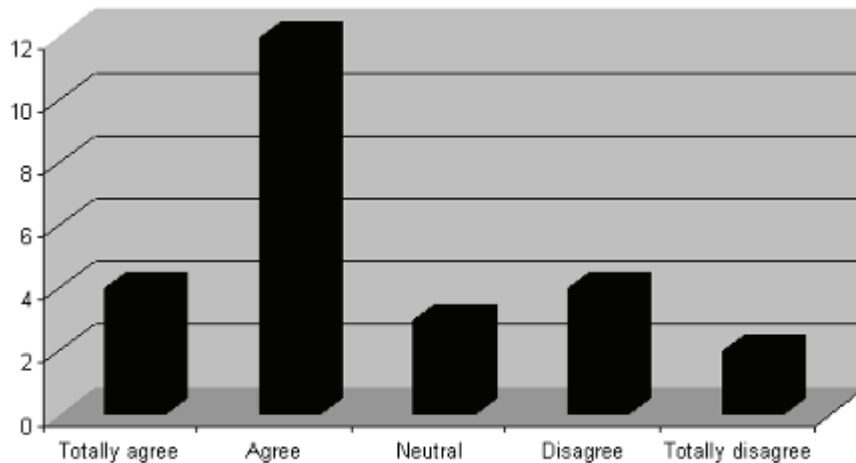
1.3.1 Methodology

In October 2006, a brief online questionnaire on social software was sent out by e-mail to 43 international experts in the fields of e-learning, web2.0 and social software. The survey tried to determine how social software was perceived by this panel of experts, that consisted of researchers from university departments (such as communication studies, sociology, computer-sciences, pedagogy and psychology) and seminal experts from various international consultancy firms or research and government institutes. Three days after the initial invitation email, a reminder email was sent to those respondents who did not fill in the questionnaire. The qualitative survey was closed after a period of 14 days. A response rate of 58% (25 respondents) was reached.

1.3.2 Results & discussion

First, the participating experts were asked to what extent they agree with the following definition of social software: “*Social software is software that enables communication through digital technologies during which people connect, converse, collaborate and form online networks in a bottom-up fashion.*”

Table 1: answers to the question ‘Do you agree with this definition in terms of capturing the key-aspects of social software? (N=25)



The table above (table 1) shows that the majority of the respondents agreed with the definition I provided and that was distilled from the literature review. Sixteen people indicated their agreement, three people indicated no opinion and six respondents were dissatisfied with the provided definition. Overall, the majority of the respondents agreed with the definition I provided.

1.3.3 A definition for social software

Next, the respondents were asked to give their definition for social software. People who did not agree with my definition placed more emphasis on network effects, social interaction and social data in their definition of social software. On the basis of the analysis of the received feedback, I rephrased the definition for social software to incorporate some of the remarks of the experts. This resulted in the following definition: *“Social software is software that enables communication through digital technologies during which people connect, converse, collaborate, manage content and form online networks in a social and bottom-up fashion.”* This definition will be used in the remaining of this paper.

1.4 Typology for social software

In his 1998’ speech at a MIT conference on democracy and new media, David Winston (2003) explained how digital technology changed historically. Digital technology moved fundamentally from computing to communications. After the internet had become a reliable means of communication between individuals, online content started to get better, richer and more searchable. In the end, this led to more effective collaboration than in the past and to the emergence of online communities where people can, in new ways, share interest, engagement and knowledge.

Winston regards content, communication, collaboration and community as the new arbiters of culture and political conversations. I want to use these four key concepts as a theoretical foundation for a typology of social software. Social software is not a single service exclusively aimed at creating online networks or communities but is, rather composed of different functions facilitating content management, communication, collaboration and community related activities.

Social software is a complex and multi-dimensional phenomenon consisting out of a mix of these four 'C's' (content, communication, collaboration and community related dimensions). Each of these dimensions has its own theoretical significance and can be viewed as a key concept in the understanding of the term social software or as a basis for making evaluations of social software. I want to analyse the complexity of social software by presenting a synthetic approach that combines these four dimensions. Such an approach helps to explain the multifaceted nature of social software and allows me to visualise the different usage or design patterns in social software by means of a radarplot.

1.4.1 Defining the dimensions

In this section I will briefly describe the four C's that I want to use as guidelines, as a basis for evaluating social software.

I will use the term *content management* to refer to the functions in social software facilitating users to manage and create content for personal use or gain. This dimension is prominent in social bookmarking software (for example: <http://del.icio.us>). Social bookmarking software enables online information management as it provides its users an online archive and easy, intuitive and efficient access and cataloguing mechanisms.

The dimension *communication* reflects social software services that assist in the exchange of information between persons. E-mail, instant messaging or most of the weblog mechanisms (for example: <http://www.blogger.com>) are situated in this dimension as their design is primarily focussed on publishing ideas and supporting the conversations that arise around them.

Social software functions enabling users to cooperate with a person or agency are classified under the dimension *collaboration*. This dimension incorporates software features typical for wiki-websites (for example: <http://www.wetpaint.com>) such as the ability to look at older versions of a document or to restore an older version of the document.

Finally, social software functions mediating in the creation and maintenance of online communities and networks are placed under the dimension *community* (for example: <http://www.linkedin.com>). I use Wellman's definition for communities to elucidate communities as "networks of interpersonal ties that provide sociability, support, information, a sense of belonging, and social identity." (Wellman, 2001, p. 227).

1.4.2 Social software as a multi-dimensional phenomenon

Each of the four dimensions - contentmanagement, communication, collaboration and community - is present to some degree in a social software application. In the previous section I gave examples of how some social software services place more emphasis on a particular dimension than others. However, as several authors (Bijker, 1995; MacKenzie & Wajcman, 1985; Silverstone & Hirsch, 1992) indicated, the functions present in software design can not be regarded as the only determinants of their impact on culture and society. It is how these features are adopted and used that will determine their position on the four dimensions and their impact on society.

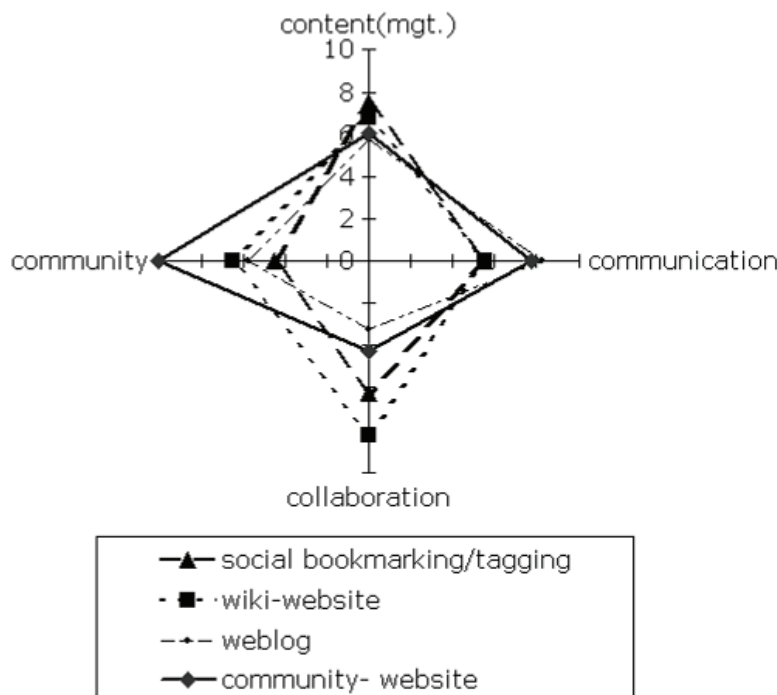
The dimensions above can be used to visualise certain types of social software. This approach has some important advantages. It allows easy and quick identification of the dimensions on which the social software in question places more emphasis. Furthermore, it allows analysis of the multi-dimensionality of a particular social software service by looking at the surface area the social software service covers in the radar plot. Finally, it enables comparison

between the design of a social software application and the actual use because both can be mapped onto the same radar plot.

1.4.3 Visualising social software

Four communication scholars were briefed in face-to-face sessions about these four dimensions in social software. They were given definitions delimiting the concepts of social bookmarking software, weblogs, wikis and social networking sites. Next, they were asked to indicate how important certain dimensions are for the social software services under consideration. The respondents indicated their opinion on a 10-item scale, ranging from ‘not important’ to ‘very important’. The results were aggregated in the radar plot below (Fig. 1).

Fig. 1. 4 social software services mapped on 4 dimensions



More efforts are needed to develop a questionnaire and other research tools (for example online participative observation techniques) that probe the importance of each dimension in a more subtle and thorough manner. Future research will also include the construction of a toolkit for the analysis of specific social software cases, combining content analysis with methods from the fields of usability and sociability studies.

2. Social software and social capital

2.1 Impact of new media

In general, introductions of new (media) technologies give cause for questions about the effects or impact of this new technology on society (Jankowski, 2002; Williams, 2002). These concerns over the impact of new media technologies are of all times. For example, Socrates bemoaned writing as he foresaw that memory would be weakened by our reliance on text and he warned that “writing allows all manner of strange couplings: the distant influence the near, the dead speak to the living, and the many read what was intended for the

few” (Peters, 1999, p. 37). The possible effects of new forms of mediated communication were examined each time a new communication technology reached the market (radio in the 1920’s, television in the 1950’s, ...) and the same questions were raised in the 1990’s when the internet infrastructure became available to the public in general and internet as a cultural practice reached the point of critical mass. What is the impact of internet on our lives? Does the internet undermine community or does it create new possibilities for its expression?

Conclusions and opinions are diverse. Utopians or boomers (for example: Gilder, 2002; Negroponte, 1995; Rheingold, 1993) believe that the internet can increase social cohesion and that it will allow us to do more. Dystopians or doomers however (for example: Parks & Floyd, 1996), state that interaction in an online environment becomes mechanised and empty. They believe that without the richness of face-to-face communication the internet only creates ‘the illusion of community’. Finally, other authors (for example: Anabel, Wellman, Witte, & Hampton, 2002) claim that the internet neither increases nor decreases social cohesion but instead works to supplement it.

Ågren (Ågren, 1997) describes three similar perceptions on the concept of communities and its relationship with new media technologies: ‘community lost’; ‘community saved’; and ‘community liberated’. He believes that the difference between these perceptions lies in the ‘relationship’ characteristic. ‘Community lost’ is typified by the absence of informal relationships. ‘Community saved’ is characterized by few strong informal relationships and ‘community liberated’ is marked by many weak informal relationships.

An important factor in this discussion is the supposition about how and by whom online access to information and people is controlled. In computer-mediated-communication (CMC) studies, digital information technologies and their applications are often supposed to break through boundaries and hierarchies present in society. Although new technologies can also result in the creation of new boundaries and classes (for example: the digital divide), the idea of more emancipation and freedom returns every time a new technology is introduced. New technologies are often supposed to have an emancipatory feature. Enzensberger, for example wrote about the emancipatory potential of the transistor radio: “For the first time in history the media are making possible mass participation in a social and socialized productive process, the practical means of which are in the hands of the masses themselves.” (Enzensberger, 2000, p. 52).

2.2 Networked individualism and egocasting

This emancipatory feature is also present in the discourse and research on social software. The unique properties of social software allow for new forms of participatory culture in which consumers take media in their own hands, through bottom-up processes, to serve their personal and collective interests. They allow cyberspace to become “(...) a new arena for participation in public life... users can act as media audiences ... yet users are also authors, public rhetoricians, statesmen, pundits.” (Fernback, 1997, p. 37).

This participatory culture enables consumers to produce, distribute and consume online content at marginal or zero costs, and thus enhances our involvement in the ‘negotiation of meaning’. This involvement is important because it defines who we are: “At stake is the capacity of the household or the family to create and sustain its autonomy and identity (and for individual members to do the same) as an economic, social and cultural unit.” (Hirsch, Morley, & Silverstone, 1992, p. 19).

In a network or information society, the individual occupies center stage. Communities and groups are often no longer based on a specific location but on individuals and their practices: “This is a time for individuals and their networks, and not for groups. (...) The broadly-embracing collectivity, nurturing and controlling, has become a fragmented, variegated and personalized social network.” (Wellman, 2002).

The person has become the portal (Wellman, 2002) in an atomised society. Wellman describes this move from densely knit and tightly bounded groups to sparsely knit and loosely bounded networks as a move towards ‘networked individualism’. In this networked individualism internet users access almost infinite amounts of information, share their favorite files, communicate and interact with others. The digital information that they handle is hyper individualised and continually renegotiated. It reflects what they feel (for example: entries on web logs or online discussion boards), find important (for example: subscriptions to rss-feeds) or want to share (for example: ‘seeding’ files in a peer-to-peer network).

In a seminal article “The Age of Egocasting”, Christine Rosen (2004/2005) described how technological advances accumulated in the capability to create a personal bubble, inside which we as “content consumers” are the sole masters of what we see and hear. She called this egocasting and defined it as “the thoroughly personalized and extremely narrow pursuit of one’s personal taste” (Rosen, 2004/2005, p. 52), where we exercise an unparalleled degree of control over what we watch and what we hear.

2.3 Social software and social capital

In our definition of social software I stated that social software targets the fulfilment of certain needs (the need for content management, communication, collaboration and community) and that it tries to do so by means of social, bottom-up processes. Thus, social software tries to create and maintain social networks.

Most social software services facilitate participation from ‘the edges’, from the periphery of the group. Users do not have to participate fully, in order to be recognised as a member of the group or network. One can participate from the fringes of the group or not participate at all and merely observe. Thus, getting connected to the internet or becoming member of a social software website often means getting access to a stock of social capital. Social software can widen the experience of community (helping to connect with others who have different beliefs or backgrounds) or social software can deepen the experience (reinforcing and strengthening existing social networks). This indicates that social software can be used to augment online individual social capital.

2.3.1 Social capital: definition

Social capital does not have one precise or universally shared definition but its central thesis can be summarised as ‘relationships matter’ or ‘networks are a valuable asset’ (Field, 2003).

The first systematic use of the term was by Bourdieu. In his book ‘The forms of capital’ Bourdieu distinguished, inspired by Weber, three types of capital: economic, cultural and social capital (Bourdieu, 1985). He described social capital as access to various currently held and other potentially accessible resources that are based on group membership: “the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance and recognition ... which provides each of its members with the backing of collectively-owned capital.” (Bourdieu, 1985, p. 248).

A second approach to social capital was provided by J.S. Coleman (1988). In his view, social capital consists of the resources available to an actor by virtue of his or her participation in a social group. Social capital can be mobilized to achieve the individual's interest. Just as Bourdieu, Coleman stresses the role of networks and groups in the formation of social capital. This network-approach differs from that of Robert D. Putnam who emphasises the role of norms and values in social capital. His attitudinal approach describes social capital as "connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them" (Putnam, 2000, p. 19) and states that: "the core idea of social capital theory is that social networks have value" (Putnam, 2000, p. 179).

Lin (2001, p. 29) summarises social capital as: "resources embedded in a social structure that are accessed and/or mobilised in purposive actions".

The word capital suggests that we can invest time, effort and money and that we can expect a returned value. This returned value can take different shapes. It can be emotional (for example: expressions of approval and respect) or informative (for example: receiving factual information or support in the information seeking process). It can be instrumental (for example: practical help and relief of certain burdens) or assersive (for example: receiving feedback from peers) in nature.

The three seminal authors above can be criticised for their homogeneous and undifferentiated approach to social capital. They downplay the negative effects that social capital can cause and do not differentiate between different types of social capital (see 2.3.2). Furthermore, their approach to social capital and how it evolves over time is rather crude (Field, 2003).

2.3.2 Dark side of social capital

Social software is not necessarily always positive for the health or the common good of the whole. Baron (Baron, Field, & Schuller, 2000) points out that, in general, social capital is referred to in positive terms. This way, social tension, inequalities and discrimination in society stays hidden (Franklin, 2003). Communication, collaboration, community and group-forming processes can however, be disadvantageous for people who are not involved in these activities or who do not belong to that specific network. Robert Putnam describes this as the 'dark side of social capital' (Baron et al., 2000). He tries to explain this phrase by making a distinction between 'bridging' groups (inclusive groups that join different sorts of people into a community) and 'bonding' groups (exclusive groups that join people who are similar to each other). An important distinction because: "(...) the externalities of groups that are bridging are likely to be positive, while networks that are bonding (limited within particular social niches) are at greater risk of producing externalities that are negative." (Putnam, 2002, p. 11). Bridging social capital tends to bring together people across diverse social divisions. Bonding social capital tends to reinforce exclusiveness and maintain homogeneity. Hyper pluralism and overspecialization can be expected to encourage bonding among regular members (Norris, 2004). Too much bonding can result in the exclusion of outsiders, excess claims on group members, freedom restriction and a downward levelling of norms (Portes, 1998). Too much bonding can thus climax in dark or negative social capital: in groups that press - to a dysfunctional level - their uniqueness as being more important than the common good of the whole.

2.3.3 Level of operationalisation for social capital

Although standardisation in the measurement of social capital appears to be still far away (van der Gaag & Snijders, 2002) social capital can be operationalised on a collective (macro,

meso) or an individual (micro) level. On a collective level, it represents the amount of trust and social cohesion within a network. On an individual level, social capital refers to three dimensions: “(...) the (number of) alters in the individual social network 2) the resources these alters give access to 3) the availability of these resources from alters to the individual, of which the willingness of alters is a major component.” (Flap (2000), cited in van der Gaag & Snijders, 2002).

2.3.4 The 4 C's in social software

When evaluating social software and its relation with social capital, the typology of 4 C's (see 1.4.1) can be used as a framework. This framework allows each social software application or service to be analysed on four dimensions. A user centric approach to the four C's provides researchers with information on how the social software service is used. For example: a web log is used by person x to create and sustain conversations round a certain topic (emphasis on communication), by person y as a tool to archive online content (emphasis on content management) and by person z as a way to obtain a sense of belonging, a sense of membership to a specific group (emphasis on community). A more functional, design-related approach to the four dimensions provides researchers with information on how certain social software services are designed.

Each of the four dimensions can be used or designed to create bonding or bridging social capital. Each of these dimensions can create emotional, informative, instrumental or evaluative value for the user of the social software application. Communication can take place in closed (invitation-only) environments (for example: an instant messaging application) making the communication process one of bonding amongst peers, or in an open environment (for example: certain parts of the blogosphere) which may result into bridging. Online collaboration or community-forming can happen in peer-groups (for example: certain file sharing networks, also called 'darknets') closed to non-members, or amongst anyone with internet access (for example: wikipedia, mspace or secondlife). It can be inclusive or exclusive. It can join different sorts of people or join people who are similar to each other.

Conclusion

Distinguishing different dimensions in social software and acknowledging the dark side of social capital provides us with a framework that allows a more subtle approach to the analysis of social software services and the complexity of online sociability. The framework does not regard social software as a one-dimensional concept but as a concept that includes different types of use. Furthermore, I argue that each type of use can have different relations with social capital. The complex interplay of content, communication, collaboration and community related use of social software features will reflect in how they join (or divide) similar or dissimilar people online.

How will these two seemingly contradictory tendencies play themselves out? Will the use of social software result in a flowering of the social sphere (bridging social capital), or in the retreat to a balkanized social clique (bonding social capital)? One of the big challenges for social software design will be to incorporate both tendencies: facilitating a dynamic environment for selective associations (friends, communities of interest, colleagues) to operate, while at the same time enabling them to expand and explore their boundaries without loss of identity and cohesion.

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Ethical Behaviour of Self-Aware Agents

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"Ein grosser Vorsatz scheint im Anfang toll"

Goethe, *Faust*

Abstract

The paper develops, in BBT context, the critical problem of ICT ethics, examined in [3]. Thus, its objectives are adapted accordingly: a) To validate ethics as a general design-space dimension for agent-oriented applications; b) To substantiate the urgency of user-driven ethical behaviour of self-aware agents; c) To enable such behaviour by a safe, simple, and ethically uncontroversial agent-oriented toolkit; d) To exemplify the toolkit by an improved version of the “ethical potentiometer” described in [8]. The guidelines are: a) integrate ethics in any agent-oriented design; b) ensure that any misuse is avoided; c) allow flexible switching between various ethics; d) control ethical agent behaviour; e) to become aware of ethical behaviour, agents must have some degree of self-awareness.

The paper presents: 1. *The Ethical Toolkit*. A collection of features that enables the user to control the ethical behaviour of the its agent. 2. *Ethical Replication*. The agent is able to change his current ethical state through replication. 3. *Ethical Self-Awareness*. The agent is aware of his current ethical state and also keeps track of the previous ones, using *ethical replication*. The agent behaviour model is the first step in the development of a more ethically (self-)aware agent.

1. Introduction

The BBT takes human interaction to a new level, where individual are easily represented by virtual peers, which act independently in order to complete the user specified tasks. The problem of ICT ethics becomes critical in the broadband society, where many questions about the means by which agents achieve certain goals arise. If they are very effective, their behaviour may be qualified as *machiavellic*. If their behaviour is *friendly* or *polite* regarding the environment and other peers, they may be considered inefficient. These issues, examined in [3], are the starting point in setting the objectives of this paper.

Since, regarding ethics, not even conventional ICTs fulfill user expectations, it is *mandatory* to take into account ethical aspects when agents penetrate all innovative application domains. Moreover, it becomes *urgent* when their key purpose is to *interact* with humans as well as with their peers, since they act consistently with their own *intentions* – regardless whether they are opponents (e.g., in e-commerce) or partners (e.g., in e-therapy). In fact, they try to *persuade*: from ancient rhetoric to modern advertising, “the power of persuasion introduces additional legal and ethical questions. [...] No simple list could empower agent designers to guide their agent development efforts ethically and legally” [20].

Accordingly, the *objectives* are:

a) To validate ethics as a general design-space dimension for agent-oriented applications;

- b) To substantiate the urgency of user-driven ethical behaviour of self-referencing agents;
- c) To enable such behaviour by a safe, simple, and ethically uncontroversial agent-oriented toolkit (for instance, the potentiometer applied for an e-Learning application [25]);
- d) To exemplify the toolkit by an improved version of the “*ethical potentiometer*” described in [3].

Since intention involves moral responsibility, agent behaviour must show a wise blend between ethical *intransigence* and pragmatic *effectiveness*. Therefore, aspects of ethics as design *dimension* correspond to categories of ethics as *system*, expressing various degrees of rigor. At one extremity, one can situate the strict deontological ethics (total intransigence: standards can never be broken, regardless of causing pain), at the other, one can situate the Epicurean act-based pragmatism (“pro and con” ethics); and somewhere at midpoint one can place the rule-based utilitarianism (rules are set in place only if always following them proves to be beneficial) [14].

2. Rationale and Approach

Like any amplifier, powerful technologies increase the impact of (macro-architectural) application features – including their previously unnoticed side effects – and, hence, the risk of ethical faults. Two such major, innovative, and influential technologies are: *broad-band* (offering huge amounts of information) and *agents* (proposing new ways to process it). Their combined effect: humans act in entirely new environments: open, dynamic, uncertain. In this lawless jungle, the risk of ethical faults becomes huge and therefore agents must behave ethical too.

In e-therapy persuasion becomes commonplace, due to the major role it plays in therapeutics, no matter the technology employed. It also distributes responsibility, involving the persuader’s moral liability [8]. The ethical facet of any medical act is of major significance, and persuasion broadens it.

Ethical behaviour is eased through – at least a primitive form of – self-awareness. The agent needs to be permanently aware of its current ethical state and keep track of the previous ones, so that these may influence future changes in its behaviour. To reach such a target, BBT offers an affordable “general toolbox”: agent-oriented software engineering [1].

The attempt to examine the ethical facet of agent-based applications and to show – via an experimental model – ways to control agent ethical behaviour is driven by – and filtered through – the following assumptions, criteria, and guidelines [8]:

- Integrate ethics in any agent-oriented design, so that the user may specify the ethical behaviour of the agent representing him;
- Ensure that any misuse is avoided, by taking the necessary safety measures;
- Allow flexible switching between various ethics, the agents behaviour won't be rigid, but it will change and adapt to the environment and the users requests;
- Control ethical agent behaviour, the agent will follow a user-specified ethical path: thou the agents ethical state will change under the influence of the environment, it will always be within the grid specified by the user;
- To manifest ethical behaviour, agents must have some degree of self-awareness: the agent will be aware of his ethical state and will be able to go from one state to another, as specified by the user and as a reaction to the environment; (Self-aware agents are presented in a related paper)
- Because “persuaders have always stood on uneasy ethical ground” [14], so as to prevent unintended outcome, the agent behaviour should be more strictly controlled. (by the application developers who should create good behaving agents)

This approach aims at proposing a test field for experimental models of human-controlled, self-aware agents, of reduced cognitive complexity [7]. On this basis, in later model versions, the level of ethical rigour could be raised or lowered by the user, in order to achieve the desired results.

3. Generic Architecture

Then experimental model has three innovative key features for implementing ethical self-aware agents. Some of these are described in detail below, while others are also subject of related papers [9], [25], [8].

A) Ethical Toolkit

The *Ethical Toolkit* is a collection of simple tools that help giving the agent an accurate ethical description. The first one in this kit is the *Ethical Potentiometer*, inspired from [8]. The Potentiometer metaphor suggests that the user may adjust the ethical behaviour of the agent, like fine tuning a radio. The number of the agents ethical states, corresponding to the states of the *Ethical Potentiometer*, may vary, from very few to many, a finer division. For instance, as represented in Fig. 1, an *Ethical Potentiometer* may have flowing steps: *graceful*, *polite*, *fair*, *selfish*, *machiavellic*.

Fig. 1. Switching between discrete ethical behaviours.



The concept of Potentiometer is easy to implement and to adapt, flexible, can be applied in almost any context and also easy to keep track of, this fact being very important for the implementation of the other features.

B) Ethical Replication

Is the ability of the agent to change its current ethical state, as a reaction to the environment. Although *Ethical Replication* is a reaction, it is not a random one. The replication respects an *ethical grid* previously defined by the users, so that they may always be in full control of the agents ethical behaviour.

The agent also keeps track of its previous ethical states, upon which the decision to change the current one also relies. This feature is therefore essential for *Ethical Self-Awareness*.

This feature is implemented using *Self-Cloning*, a process described in [7] and [9].

C) Ethical Self-Awareness

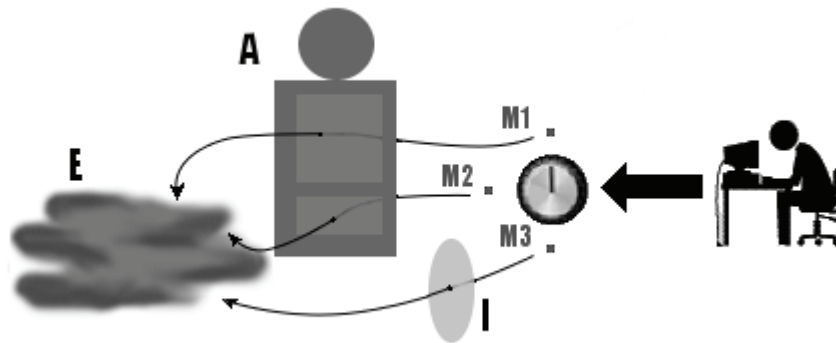
Refers to the agents ability of being permanently aware of its current ethical state, reflected through tools from the *Ethical Toolkit*, like the *Ethical Potentiometer*, but also of its previous ones. It is directly related to *Ethical Replication*, being, next to the *ethical grid*, the key factor in deciding a change of the ethical state.

These tools are closely related and depend one on another. They are also vital in creating an accurate ethical image of the agent and controlling its ethical behaviour.

4. Experimental Model

The *Ethical Potentiometer* was successfully implemented into an e-Learning application. The model is described in [25] and briefly using the simplified Fig. 2.

Fig. 2. Using the Ethical Potentiometer in an e-Learning Application.



E-Learning environment (E). The amoebic shape suggests its nature: open and heterogeneous (the resources involved are unlike and their availability is not warranted), dynamic (high pace of exogenous and endogenous changes) and uncertain (both information and its processing rules are revisable, fuzzy, uncertain and intrinsically non-deterministic stimuli generator). On the other hand, micro-continuity and reusability require also some conventional e-Learning software in the environment. Now it is modelled as a “very proactive search engine” (in the current experimental model it is oversimplified as a kind of “personalised search engine with many messages”).

Agent (A). It uses the *Ethical Potentiometer* to chose the appropriate *Working Mode* to the users requests so that it may retrieve the information as accurate as possible.

Interface (I). The unusual situation of having an interface beside the interface agent was justified by security/protection reasons: the user is still in control even when the agent is (in part) out of function.

Security/Protection Work Modes (Mi). “Security” refers here rather to ethical aspects than to technological ones. There are three echelons of application functionality expressed through working modes: M1) Normally, the learning process is conceptualised in line with the modern IT paradigm “computing as interaction”, where the coach-trainee communication is intense in both directions (i.e., both parts are proactive). M2) If some agent action or behaviour seems deontologically suspicious, the application performs according to the older “client-server” paradigm, where the learner takes initiative while the agent is reduced to conventional e-Learning software [24]. M3) In critical situations, the agent is totally cut short and the learner uses a conventional interface to interact with the environment or to access the ontology. Switching between modes is carried out with an *Ethical Potentiometer* (implemented first for virtual therapy [8] and now adapted for e-Learning).

The current model describes a self-referencing, exception-driven agent, carried out as pseudo-avatar, able to: *learn* (mainly from environment stimuli, through inductive inferences); *assess* “Simon-learning” of humans and agents (by the task duration derivative); *clone* itself after learning to spawn “smarter progeny” (transferring recently acquired knowledge into their genotype, i.e. into the executable program representing statically the agent). Emphasis moves

towards (parentheses embrace the “rather than ...”): interactive (bibliography), adaptive (e-tutorials), knowledge extraction (information retrieval), error-driven (grading test results), trends (detailed facts).

5. Conclusions and Future Work

- Especially for BBT agent-oriented applications, ignoring ethics is unacceptable;
- Despite being “ethically neutral”, broad-band technology amplifies the risks of ethical faults, above all in modern applications, where humans and agents interact in open and uncertain environments;
- Users should control the ethical behaviour of interface agents according to “human ethics”, ignoring suspicious concepts like “digital ethics”;
- The easy to implement “ethical potentiometer”, able to model suitably a wide range of ethics and to control agent behaviour from the perspective of the chosen level of ethical rigour;
- Neither research, nor application development can advance without extensive transdisciplinary research (involving not only domain theory and ethics themselves, but connecting them to psychology, sociology, application domains, etc.);
- Agent-oriented approaches based on design-space dimensions (here, ethics) confirm their utility also in medical informatics, for both research and application development (first, in therapy).
- The experimental model of the *Ethical Potentiometer* implemented in the e-Learning application [25] was an easy implementation of the generic architecture and proved to be effective.

Future research objectives are the investigation of the the impact that dependability of the conveyed information (exact, approximate, fuzzy, uncertain) can have on ethical behaviour, the way it is perceived, and the development of the *Ethical Potentiometer* and the *Ethical Toolkit* according to user specifications.

The agent behaviour model is the first step in the development of a more, in particular ethically, (self-)aware agent, but also in achieving general self-awareness. This concept is rooted in two ideas of Hofstadter [21]: “consciousness is not an on/off phenomenon, but admits of degrees, grades, shades” and: the first step is self-reference.

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Mobile E-Actors In Saturated Environments: Patterns Of Co-Construction

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Abstract

This contribution will attempt to identify a set of key-words and discursive frames which lead the design and social shaping of humans as e-actors at the crossroad of mediated mobility and ubiquity. Bodies, actors and environments are increasingly constructed around pervasivity and ubiquity of technologies. Mobility and ubiquity, in this respect, represent two complementary keys to understand how humans as e-actors are imagined, and discursively represented, as intertwined with an environment which is saturated by a wide array of technologies.

Being on the move in their everyday life, humans as e-actors are required to manage the crucial combination of mobility and proximity in order to be skilled users and competent communicators. In this respect, concepts of convergence and saturation help to frame the miniaturization and portability of technological devices as well as the design and projection towards ubiquitous, pervasive computerized environments

How is technological saturation affecting connectivity and connection among social e-actors? How is convergence between the body and the environment under the sign of a ubiquitous communication shaping choices and resistances to models and representations of users as e-actors? Around these questions, some theoretical and literature-based reflections will be carried out.

1. Introduction

The key-argument of this paper draws from the analysis of e-actors as authors of an active shaping of ICTs: e-actors are situated at the crossroad of at least two analytical dimensions which are increasingly technologized, that means the body and multiple electronic environments.

On the one hand, the body is the crossroad of several technological embodiments which make it both more artificial and more transparent (cf. Maldonado, 2002). On the other hand, this body which is transformed and hybridized through technological devices is immersed and surrounded by electronic (e-) environments. E-environments are saturated by technologies defined non only as mobile, but ubiquitous, at disposal anywhere anytime of actors' interaction and eliciting that interaction in a transparent, unquestioned modality (cf. Greenfield, 2006). Mobile and ubiquitous technologies are the theoretical case examined in the paper to illustrate how environments and bodies co-construct e-actors in their relationship with multiple social settings and discourses.

The encounter between e-actors and e-environments textures - and is textured in turn - through a rich grid of concepts, devices and discourses, where materiality and immateriality, opacity and transparence are complexly intertwined.

The aim of this paper is to draw such a grid identifying concepts adequate to navigate the new spatio-temporal patterns of interaction which are embedded and enacted through technologies of mobility and ubiquity (e.g., the mobile phone especially in its 'smart' version;

ubiquitous computing infrastructures). These concepts define characteristics of actors (e.g. their sociality and ability to resist technologies; their hybridity and heterogeneity; their being very much ‘on the move’) and of environments mediated and saturated by technologies (e.g. saturation, convergence, ubiquity, connection and connectivity). From such a conceptual grid, representations and configurations of how ‘idealtypical’ (sometimes, stereotypical) e-actors should behave will be drawn, referring to the designers’ discourse on mobile and ubiquitous computing.

The paper is structured as follows. First of all, the relationship between environments and bodies as two sides of the coin of an increasing technologization will be articulated through the categories of convergence and saturation.

Secondly, an analysis of the concept of e-actor will be provided using different theoretical frames.

The subsequent sections of the paper will describe environments and mediated bodies using the categories of mobility and hybridity. From all this a ‘portrait’ based on representations of users of mobile and ubiquitous computing will be discussed, emphasizing the role multiple public discourses (cf. Iacono and Kling, 2001) play in shaping these advanced sociotechnical arrays. Eventually, ubiquity, connection and connectivity will be presented to analyze communication and interaction in the process of co-construction of saturated environments and mediated bodies.

2. From environments to bodies: convergence and saturation

The relationship between environments and bodies is mutual and constitutive of the way technologies and e-actors interact with each other. In fact, e-environments constitute the background where mediated bodies, more and more hybridized by various technologies, play their role as e-actors on the scene. In turn, the body itself becomes a technologized environment where portable, miniaturized technological devices act as its extensions.

In this respect, two key-words describe such an interaction-relationship: convergence and saturation. On the one hand, environments and bodies are ‘tuned’, find a convergence, on the basis of technological devices and infrastructures which are adjusted reciprocally so to create a continuous texture between them. Such a texture, on the other hand, makes technologies literally saturate and fill up the environment, making ubiquitous (anywhere anytime) interaction at disposal of users as e-actors.

Different types of convergence can be distinguished for analytical purposes. First of all, media history and ICTs evolution can be re-interpreted as the result of processes of convergence which act at an *infrastructural, architectural and market* level. This is particularly evident for mobile technologies here analyzed, where the trend is marked by “(...) the progressive blurring of the traditional boundaries between previously separated fixed and mobile markets which is led by the continuous technological developments, the latter being responsible for a completely new communications network architecture known as NGNs (Next Generation Networks” (Feijoo et al., 2006: 3). In such a process, big emphasis is put on the ‘mobile broadband access’ as the next frontier in telecommunications infrastructure, along with “the evolution of mobile Internet as a converging process of access platforms, technologies, contents and services (...)” (Ramos et al., 2004: 76).

This process of convergence is accompanied by a strong institutional discourse where rules for the competition, representations of the users’ needs along with policies to reduce the digital divide are pursued (e.g. policies adopted by ITU, EU and so on).

Secondly, there is a *material* profile of the convergence, which has to do with miniaturization and portability of multiple, multifunctional mobile technological artefacts (e.g. I-pods, PDAs, and so on). This aspect of the convergence is particularly linked with the body and redefines

materiality and visibility of technology. Size and multifunctionality of portable technological devices make them more and more embeddable, wearable and textured within or around the body.

It is not just the mobile phone which becomes more and more 'filled' with functions and services concentrated in smarter and smarter devices, but also the environment, which becomes increasingly textured and embedded with pervasive, unobtrusive, ubiquitous technologies (cf. Lyytinen and Yoo, 2002a, 2002b; Greenfield, 2006).

The last point makes convergence also a *functional* process, in many senses. On the one hand, the mobile phone is increasingly a synthesis and a concentration of communicational routines, functions and uses before belonging to different media (e.g. mobile e-mail through blackberry, video download and upload through camera phones, texting through SMS, static and dynamic pictures through MMS and so on). In this sense it can be defined not only as multi-media and multi-function device, but also as "a meta-device (...) establishing the bases for a truly integration of options and services that make the base of the mobile telephony mediatisation process" (Aguado and Martinez, 2006a: 2). Such a versatility and multifunctionality is one of the preferred topics in the media discourse on mobile phone services (cf. Aguado and Martinez, 2006b).

Furthermore, these processes of convergence are targeted towards the environment and the body, in the sense that technologies converge on both these poles. This is linked on the one hand with the concept of saturation, on the other hand with the concept of hybridation (cf. *infra*).

Saturation draws on Bowker and Star's (2000) analysis of classifying and standardizing and refers to the qualification of the mobile phone as ubiquitous technology (Ling, 2004) accessible everywhere/everytime. Saturation defines ubiquity as infrastructural resilience. As Bowker and Star put it: "Classification and schemes literally saturate our environment. In the built world we inhabit, thousands and thousands of standards are used everywhere (...) This categorical saturation furthermore forms a complex web. Although it is possible to pull out a single classification scheme or standard for reference purposes, in reality none of them stand alone" (Bowker and Star, 2000: 37-38). According to Bowker and Star, the texture of saturation is "a matter of integration, almost like a gigantic web of interoperability" (2000: 38), and therefore so difficult to see and to grasp in its patterns.

The concept of saturation describes the way our bodies and environments are intertwined into chains of sociotechnical relationships where technology is imagined and represented as a *continuum*: like in the 'everyware' ubiquitous computing, where technology is said 'to colonize everyday life' (Greenfield, 2006). The body is one of the 'intelligent terminals' interacting with such an environment. The electronic body and its dissemination along different organizations/settings is the other side of the corporeal body: both are more and more 'on the move' as this corporeal body carries with it an increasing 'charge' of electronic information which is stored and distributed in the environment.

Saturation has also to do with the way the mobile phone shifts patterns of communication, integrating co-presence in proximity and at distance (Urry, 2002), as well as establishing the oxymoron of "the presence of those who are absent" (Fortunati, 2000: 9). All this contributes to form a 'gigantic web of interoperability' not only from the viewpoint of the materiality of technological infrastructures (the 'cellular grid' with its squared lines, connections and material networks surrounding it) but especially from a symbolic viewpoint.

In the complementary discourse on ubiquitous computing which aims "to augment common structures and everyday artifacts as interaction devices that inherit design affordances from the physical world for interaction with the digital realm" (Schmidt et al. 2002: 1), saturation occurs again in the form of disappearance of the infrastructure, complementing the mobile

phone saturation and enriching it with new ambitions of universal access and convergence (cf. Iftode et al., 2004).

If convergence and saturation constitute bodies and environments in the context of a mutual relationship, what kind of action does take place in this background? What does being an e-actor mean?

3. Conceptualizing e-actors

Conceptualizing e-actors means to configure their constitution towards and through technologies (ICTs namely) which can be seen as more or less ‘external’, more or less ‘embedded’ to them.

The concept of actor, in some way, implies an evolution of the concept of user, an enrichment of the potential and ability to interact, innovate and change technologies by using, consuming and interpreting them. Three conceptualizations which connect explicitly humans to technologies will be presented, as paths towards the analysis of the relationship between the social and the technical (the sociotechnical in a constructionist sense).

3.1. Users as social actors and computerization movements: the Social Informatics perspective

This perspective enriches the concept of user drawing from critical Information Systems literature and going through a theoretical integration with sociological and sociotechnological theories, especially new institutionalism and structurational approaches (Lamb and Kling, 2003) as well as Actor-Network Theory (Lamb, 2006).

Contesting a decontextualized, cognitive and abstract model of the ICT user as individualistic entity, these studies emphasize the role institutions and organizations have in constraining ICT use by actors (new institutionalist lens); they try to go beyond the dichotomy structure-agency, looking at affiliations, environments, interactions and identity emerging from the use of ICTs in daily routines and tasks (Lamb and Kling, 2003); they integrate in the framework the ANT concepts of translation, heterogeneity and partial irreversibility of networks (cf. 3.2.) to analyze how people make sense of ICTs in organizational settings (Lamb, 2006).

This theoretical frame, drawing a critical approach to cognitive-rational models of ICTs users, provides a richer contextualization of actors as connected and situated individuals (Lamb, 2006).

E-actors according to this reconceptualization are socially constrained and constituted as their action and use of technology is related to multiple factors: their everyday interactions are ICT-infused and temporalized across organizational settings where project-based identities emerge (Lamb and Davidson, 2005).

The other contribution coming from the Social Informatics field refers to Iacono and Kling’s (2001) perspective of computerization movements. In their account of the rise of the Internet and distant forms of work, the authors proposed a theoretical model based on the way meanings of a specific technology are attributed and framed by different groups of actors. These groups defined as computerization movements, whose aims and beliefs are pursued through collective action, constitute an alternative explanation for the rapid emergence and high diffusion of a new technology. Computerization movements consist of processes of societal mobilization around key-meanings (discursive frames) which establish links between a specific technology and a preferred social order. Such a frame allows to point out that e-actors are collective and frame their action through multiple levels: technological action frames, public discourse about technologies, and organizational practice (Iacono and Kling, 2001). The public discourse level is particularly interesting as it is pursued through many

'sites'. As an example, this paper will analyze designers' representations of mobile and ubiquitous technologies to understand how they envision future users' behaviours, prescribing specific models of interaction (cf. Akrich, 1992 and section 6 in this paper).

3.2. Users as resisters/innovators: the work-around concept

If the previous perspective emphasizes the constraining sides and dimensions in the e-actor constitution, other studies put forward the enabling and creative power of users as actors. Ethnographic accounts of technologies in organizational settings often tell us stories of unexpected enactments, what Orlikowski (2000) named as "technology-in-practice (...) to refer to the specific structure routinely enacted as we use the specific machine, technique (...) in recurrent ways in our everyday situated activities. Some properties provided by the artefact do not exist for us as part of our technology in practice, while other properties are rich in detailed possibilities" (Orlikowski, 2000: 408).

This pattern of appropriation of the technology underlines strategies actors enact to make sense of the technological system. More often, they can be observed as literally 'working around it'. The concept of work-around is closely connected with practices of conflict and negotiation in system development and use (Pollock, 2005). Quoting Gasser, Pollock defined a work-around as: "(...) intentionally using computing in ways for which it was not designed" or avoiding a computer's use and "(...) relying on an alternative means of accomplishing work"(cit in Pollock 2005: 497).

Work around means the active possibility 'to do things otherwise' than prescribed through institutional and technological artefacts or arrangements, similarly to what Stuart Hall observed in his encoding/decoding model (Hall, 1980) talking about "oppositional readings" performed by TV audiences.

The concepts of technology-in-practice and work around allow to account for a very important dimension of e-actors: it manifests itself through the emergence of unexpected/unplanned uses of technology, which in a constructionist view depend on the interpretative flexibility of technology carried out by relevant social groups acting and constituting technological frames (Bijker, 1995).

However, the concept of work around stresses too much the separation between systems and users, technologies and actors. To recuperate a dimension of continuity and symmetry, the third and last theoretical perspective (ANT) will be presented.

3.3. From actors to actants: the ANT perspective

Actor-Network Theory helps to draw a configuration of e-actors by putting together people and technologies, and above all attributing an agency to the non-human.

As separation of humans and non-humans is purely artificial along continuous chains/networks where actor-networks emerge as hybrids (Latour, 1992; Akrich and Latour, 1992), the symmetry between the social and the technical is pointed out. Enrolment and translation constitute the very mechanisms through which this symmetry is obtained, or performed: they comprise associations and substitutions which transform speakers and their statements, making arbitrary any division between society and scientific or technical content (Latour, 1991). In Latour's words, 'technology is society made durable' (*ibidem*); actors are defined by the list of their trials and therefore they are actants: "An actant is a list of answers to trials – a list which, once stabilized, is hooked to a name of a thing and to a substance" (Latour, 1991: 122).

Technical objects are actants as they define a framework for action (in Akrich's terms, they are similar to film scripts) and they do this "together with the actors and the space in which

they are supposed to act” (Akrich, 1992: 208). Going back and forth from “the world inscribed in the object to the world described by its displacement” (Akrich, 1992: 209) it is possible to unveil the chain of delegations, distributed competences between innovators and users, and their continuous reciprocal redefinition through objects.

Three are the points we believe relevant in ANT to define e-actors and their relationships with e-environments: heterogeneity, hybridity and intermediaries. Heterogeneity is linked with materiality, as well as with multiplicity (Law, 1997). This means relations are materially heterogeneous, performed in a variety of different media, “words; bodies; texts; machines; buildings. All mixed up. Materially heterogeneous” (Law, 1997). This reminds us immediately of hybridity and its constitution inside networks where the human and the non human are mingled, where different materials and media come together as materially heterogeneous arrays, and where “an actor is an intermediary that puts other intermediaries into circulation” (Callon, 1991: 141).

Actors are actants endowed with a character which is usually anthropomorphic (Akrich and Latour, 1992) and here the body of the e-actors comes as meaningful to define them.

To summarize, drawing from three theoretical perspectives, we have pictured e-actors as institutionally and organizationally bounded in their everyday use of ICTs, but also as collective actors able to mobilize themselves around new technologies (Social Informatics approach). E-actors are also able to innovate and work around the various technological systems they interact with, appropriating them creatively (users as innovators). E-actors are not only human but hybrid, heterogeneous networks displaced along chains of associations and substitutions where symmetry between the social and the technical is achieved (ANT perspective).

4. Mediating the body/mediated bodies: Hybridity

Hybridity as key-concept can be analyzed with reference to the *medium par excellence*, the portal where different languages converge (Fortunati, 2005), that means the body as site of convergence and saturation (cf. section 2 in this paper), hybridation and heterogeneity. Such a complex array, object and author of processes of mediation, is textured into a set of relationships more and more mediated by technical objects. Mediation which is transformative of its participants (actants in the ANT language) is held in place at multiple levels: at the level of the imagery as set of discursive frames where the human body and the machine are constantly compared (cf. Fortunati, 2002); at the level of material heterogeneity where technical artefacts/objects accompany, surround and penetrate the body itself (implanted microchips and so on); at the level of communicational patterns and routines where the model of body-to-body communication does not describe anymore the current patterns of interaction and does not constitute the classical prototype of mediated interaction (Fortunati, 2005).

Mediating the body through these different and concurrent dimensions produces a multiplicity, which means convergence of some processes on the body and, at the same time, its melting down into a chain of actants, associations and substitutions. Heterogeneity is here interpreted as fractionality (Law, 1997): the body multiple, not anymore a singularity but *multiplicity of mediated bodies*.

Mediated bodies lose their perceived naturalness as an attribute: they are increasingly fractured across technological lines of evolution (Longo, 2002), prothesized, extended and therefore transparent, less opaque and differently artificialized than in the past (Maldonado, 2002).

On the one hand, therefore, there is an obduracy/plasticity of the body to be shaped by technologies (where technology comprises a wide array of technical devices that can be

integrated and surround the body itself, from medical prosthetic devices to personal communication technologies more or less pocketable and therefore portable within or very close to the body). This is a first aspect or dimension of hybridity which refers to the interweaving of the natural and the artificial, the human and the non-human (as in the ANT perspective)

On the other hand, such an obduracy/plasticity to hybridization is confronted with transformation of the body as performing communicational routines and patterns, to the extent that “we are mediated even in situations in which we are in copresence with another person—watching TV together, discussing news-paper stories, listening to radio while driving together, and so on” (Fortunati, 2005: 55). This means analytical distinctions according to which body-to-body communication is prototypical (Fortunati, 2005), as a kind of original matrix to derive from all the other types of interaction (cf. Thompson, 1995) become hybrids in their turn. Such a dimension of hybridity concerns the way communication is experienced through the intermingling of body-to-body and mediated modes of communication, with the emergence of new forms of interaction. The discourse on mobile and ubiquitous technologies, in this sense, questions the ways interaction is performed and experienced by e-actors who are increasingly mobile in their everyday life and expected to manage hybrid interactions.

A *continuum* between mediated bodies and saturated environments can be traced: mobility is the bridging concept which allows to link *technological convergence on the body* with *technological saturation of environments*.

5. Back to environments through flux and change: Mobility

The concept of mobility is the portal to late modernity landscapes, where metaphors of flux, change and flow emerged as powerful discursive frames to account for social transformations linked with ICTs. The mobile phone as sociotechnical artefact, in this sense, is one of the icons of such a discourse. The shift of the mobile phone from work to everyday life – driving its fast growth throughout the world (cf. Castells et al, 2004; Feijoo et al., 2006; Fortunati, 2001) was accompanied and signalled by a correspondent translation in the name of the technology. As naming technologies often means naming the future, it is not trivial to observe how technologies are baptised and change their ‘identity’ along their history and evolutionary path. Media history offers multiple examples of this ‘identity crisis and re-birth’ of technologies: the mobile phone, with its ‘identity on the move’ (Fortunati, 2001) is not an exception in this sense.

Furthermore, the adjective ‘mobile’ refers to a powerful discourse at the core of contemporary societies where flux, mobility and hybridation configure themselves as core social dimensions of a new paradigm (Sheller and Urry, 2006; Urry, 2002).

“Mobility has become an evocative keyword for the twenty-first century and a powerful discourse that creates its own effects and contexts. The concept of mobilities encompasses both the large-scale movements of people, objects, capital and information across the world, as well as the more local processes of daily transportation, movement through public space and the travel of material things within everyday life” (Hannam, Sheller and Urry, 2006: 1).

Theories put forward by anthropologists of globalization and the translocal (Hannerz, 1992; Appadurai, 1996) as well as by social theorists (Wellman, 2001b; Castells, 1996; Urry, 2000; 2002) represent the contemporary world as in constant flux. Being this flux composed of loosely-bounded networks (Castells, 1996; Wellman, 1999), global scapes/flows (Appadurai, 1996; Hannerz, 1992) or patterns of different mobilities, immobilities and moorings

(Hannam, Sheller and Urry, 2006) the world is seen as a fictional and material territory variously composed but always in motion.

These different approaches to the world as 'in flux' allow to frame the co-construction of e-actors and e-environments, where ubiquity is a root metaphor for imagining and shaping interaction (cf. Pellegrino, 2006a).

Many of these approaches focus on individual actors, identifying different sources for their action, but all of them emphasize mobility and hybridity as constitutive of subjectivity and action.

Mobility is also a relational concept: "while things are always on the move, they can appear in a fixed and stable manner because mobilities are all different, and we relate to them in different ways" (Adey, 2006: 90). In this respect qualifying the phone as 'mobile' is not unproblematic: the distinction between fixed and mobile technologies is more and more blurred because of the patterns of use, which comprise both mobility and stability (Fortunati, 2001). If we look at the concept of 'relational politics of mobility' (Adey, 2006), the image of the 'mobile phone' as portable, miniaturized and anywhere-anytime device can be restructured so to comprise into it situations of stability, immobility and fixity. This paradoxical constitution reflects the "Janus face of mobile phones": "(...) the mobile phone number is the affordance that provides the nomad with a fixed address" (Arnold, 2003: 243).

6. Actors/artefacts: representations and configurations in the discourses on mobile and ubiquitous computing

Mobility is increasingly subjected to a pervasive technological mediation: being mobile is a condition enabled by different sociotechnical arrays where representations and configurations of e-actors emerge at implicit and explicit level. These arrays are constituted by the mobile phone as progressively convergent on mobile and ubiquitous computing infrastructures.

Adopting the perspective of the public discourse about technology as crucial tool to establish links between artefacts and social settings (Iacono and Kling, 2001), the discourses emergent from the designers' field will be examined, distinguishing three main sub-fields, or settings which are object of analysis and research (ubiquitous computing through augmented environments; smartphones; mobile social software or location-aware software). The hypothesis put forward is that artefacts inscribe and prescribe models of action, interaction and use and they can describe indirectly the actors imagined and expected to use them (cf. Akrich, 1992).

The first setting or sociotechnical array, identified as *ubiquitous computing through augmented environments*, is aimed to built up everyday environments conceived of as surfaces for communicative interaction.

"The key motivation is to yield interfaces that are experienced as familiar, natural and fitting in our environments, to the extent that they become peripheral to everyday activity." (Schmidt et al. 2002: 1). Therefore, the ubiquitous computing setting (Greenfield, 2006; Lyytinen and Yoo, 2002a, 2002b; Schmidt et al., 2004) shifts the focus from mobility to pervasivity, unobtrusivity and embeddedness of technology into the fabric of everyday life, so that 'technology is not just anywhere any time but in everything' (Greenfield, 2006).

This kind of 'augmented' environments aims to transforms patterns and opportunities of mediated interaction, towards permanent connectivity and ubiquity and through the encounter between saturated environments and mediated bodies (cf. section 7).

The second setting is circumscribed by evolutions and innovations concerning *smartphones*, the so called mobile web, wireless and mobile services. The so called smartphone technology, emerging from the convergence of mobile phone and PDA technologies, represents the bridge-setting towards both augmented ubiquitous environments and location-aware mobile

software. “Smart Phones are the devices that have the greatest chance of successfully becoming universal remote controls for people to interact with various devices from their surrounding environment; they will also replace all the different items we currently carry in our pockets” (Iftode et al. 2004: 1).

This idea of a portable, pocketable, unique device allowing interaction and dialogue with a wide set of environments/computing networks says many things about the way researchers in the design of wireless and mobile architectures conceive mobile mediated interaction. Building a smartphone working at once as a personal server, a personal assistant and the privileged plug-in to the surrounding environment and the Internet, reveals a project of universal, ubiquitous and equalizing communication.

The third setting is constituted by the so called mobile social software with its emphasis ‘back to location’. Functionalities of these applications include “awareness of the locations of people who are socially connected to users, ad-hoc organization of people and groups, the creation of virtual meeting places (and) richer geographical environments supplemented by social network information and information gathered through the social network” (Melinger, 2004: 3).

The field of mobile social software, with its emphasis on location, seems to contribute to the re-contextualization of mobile interaction, taking into account how location is a key-cue to the context in the perception of mobile users (Arminen, 2005). Embedding references to location in the technological artefact and allowing users to track their paths and connections in the space, however, is not immune from a subtle technological determinism, based on the idea that technology does drive social connection (cf. Pellegrino, 2006b).

The three settings identified, in conclusion, allow to draw an idealtypical profile of e-actor: the user of mobile and ubiquitous computing device is expected to wear on universal technological devices (cf. smartphones) whose embedded intelligence is in continuous dialogue with an environment where technology is unobtrusive, invisible and totally pervasive (cf. augmented environments). E-actors are, therefore, made of mediated (not only human, but also non human) bodies able to interact with the surrounding environment and to locate themselves inside it, without losing contact to their social networks spread over place and space (cf. location aware software).

Action carried by e-actors and mobile/ubiquitous artefacts as e-actors (e-actants in the ANT jargon) redefine patterns of interaction at multiple levels. Convergence, saturation, mobility and hybridity contribute to what can be defined as ubiquitous interaction, emerging from the encounter between saturated environments and mediated bodies.

7. Saturated environments surrounding mediated bodies: Ubiquity, connection and connectivity

How is interaction changing because of the multiple processes of technologization and representation of e-actors as mediated bodies connecting to saturated environments?

If “mediated communication is an emanation of body-to-body communication and swings between innovation and imitation of the latter” (Fortunati, 2005: 54), it is also true that the prototype of body-to-body communication is more and more “evanescent” (Fortunati, 2005). Mediated bodies surrounded by technologically saturated environments can interact through different patterns, where the co-presence characteristic of human interaction is variously hybridized.

In fact, there is a (*mediated*) *body-to-body communication* which extends the concept of co-presence (through portable, mobile technologies); an *intra-environmental interaction*, which is made of communication pervasively embedded into everyday surfaces and artefacts (through ubiquitous computing); a *mediated body to saturated environment interaction*,

where all of the categories of convergence, saturation, hybridity and mobility are enacted., and where ubiquitous interaction takes place.

The point in question here is how to define co-presence going beyond the corporeal co-presence of face-to-face (body-to-body) interaction. As Urry (2002: 1) puts it, “one should investigate not only physical and immediate presence, but also the socialities involved in occasional co-presence, imagined co-presence and virtual co-presence”. Mobile devices which travel with us and follow us while being (im)mobile, allow the emergence of what Urry defines ‘virtual proximities’, “multiple networks, where people can switch from one to the other (...) through the shift to a personalised wireless world (...)” (Urry, 2002: 7). These transformations which enlarge the concept of co-presence, call for a closer analysis of what kind of interaction is that definable as ‘ubiquitous’.

Convergence and saturation, hybridity and mobility are part of this interaction and define it: *ubiquitous interaction is a type of communication performed by mobile e-actors, that means human and non human assemblies (hybrids) who are mobile across time, space and context, being this mobility physical or virtual; it is extremely pervasive, to the extent of happening everywhere/every time, making time instantaneous and space simultaneous. Furthermore, it fulfils the potential of virtuality, making the relationship between connectivity and interaction more direct. Ubiquitous interaction, eventually, makes mediated communication more invisible, pocketable and easily taken for granted.*

Convergence and saturation account for the potential fulfilment of a continuous interaction: if bodies and environments are more and more mediated by technological artefacts and assemblies which constitute them as such, mediated interaction becomes more at hand and more pervasive in e-actors’ everyday life.

This point concerns basic distinctions among *connectivity* (potential to get connected to a specific medium or technological device supporting communication), *connection* and *interaction*. Going beyond a simplistic correspondence between richness of interaction and technical bandwidth of a medium, Bonnie Nardi (2005) reminded us that “to communicate with ease, we must come to feel connected to each other, we must experience mutual commitment to joint undertakings, and we must gain each others’ attention” (Nardi, 2005: 91).

If connectivity can be defined as potential to access information and distribute it (De Kerckhove and Viseu, 2004), connection is both a pre-requisite and a result for continuous interaction over time and space. In fact, “a feeling of connection is a subjective state in which a person experiences an openness to interacting with another person” (Nardi, 2005: 92). Connectivity both enables and constrains connection. Analyzing instant messaging in the workplace, Nardi concluded that “rather than undermining the importance of embodied experience for communication, simulated bodily experiences suggest that the impact of embodied experience is so great that people attempt to mimic it in the mediated context. The quality of experience changes as we move from embodied to virtual, yet the results of the transformation often achieve the intended aims” (Nardi, 2005: 123).

But this is only one side of the relationship between embodied and virtual experience, bearing in mind that forms of intermittent embodiment make virtual experience neither more nor less ‘real’ than that carried out in physical co-presence.

To conclude, ubiquitous interaction makes possible to fulfil a potential which is disclosed into ‘virtuality’ as a dynamic warehouse of chances/opportunities to communicate. Pervasive connectivity, in fact (especially in the case of augmented ubiquitous environments), increases number and modalities to establish connection and interact with other mediated bodies and e-environments. However, it has not to be taken for granted that this connectivity will always by definition enhance fields of connection (in Nardi’s terms) or enable communication.

To put it differently, transforming the potential of connectivity into actual interaction and establishing a field of connection is not automatic. Work around can always occur and transform the sign of this potential into innovative or conservative communicative practices. Ubiquitous interaction, even if (or, rather, because) more invisible and easily taken for granted, involves an invisible work of maintenance to be appropriated by e-actors.

8. Conclusion

Exploring the interrelationships between e-actors and e-environments, this contribution tried to identify analytical categories useful to frame both the poles of the relation.

Convergence and saturation, which characterize the encounter between mediated bodies and e-environments, configure e-actors as constantly on the move, at the centre of processes of mediation and technologization which converge on the body and saturate multiple environments with complex sociotechnical arrays. Bodies and environments are more and more intertwined: e-actors, therefore, have hybrid constitution, are part of institutional environments and public discourses, have the potential to work around technological systems in a creative way, and also to resist them.

Categories identified as meaningful to analyze the relation between the body and the environment configure e-actors as emerging from the encounter of mobile, hybrid, convergent and saturating technologies. This makes them able to enter and transform (being in turn transformed) a 'gigantic web of interoperability' through which interaction and communication are differently performed.

In particular, referring to the case of mobile and ubiquitous computing, it emerges how technological artifacts and infrastructures, envisioned in the designers' discourse, construct specific models of e-actors and new patterns of interaction.

Ubiquitous interaction, located at the crossroad of the categories analyzed, defines a potential to get connected which must be critically enquired, as its constitution does not automatically afford communication. Therefore, consequences of the increasing mobility, hybridity, convergence and saturation which drive ubiquitous interaction can be understood through the organizational and social practices enacted by e-actors in their everyday life. It is there that the limits and hopes of ubiquity as a metaphor for interaction will turn into more or less innovative uses of technology/sociotechnical assemblies.

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Mobile Phone, Sms/Mms, Fixed Telephone, Face-To-Face And Internet As Functional Alternatives In Everyday Interpersonal Communication

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Abstract

Drawn on the uses and gratifications theoretical approach to media choice this paper presents a study that examined the impact of new communication technologies on interpersonal communication in daily life. The mobile phone, short text and multimedia messages, the fixed telephone, face-to-face communication, and the Internet were compared to assess their usage in terms of informational - cooperative, strategic, relational, and expressive uses. The results of a nationwide representative survey, coordinated by Eurostat, indicate that albeit all social uses of new technologies, especially those of mobile phone, were profoundly integrated into everyday communication practices, face-to-face remained the dominant mode of communication. Men used the mobile phone more often for informational - cooperative purposes, whereas women used the mobile phone and the fixed telephone more frequently for relational and expressive purposes. Moreover, internet users used more frequently all technologies for managing all social activities. Finally, short text messages and the fixed telephone were assessed as functional alternatives for all types of social use except for strategic one. Our results thus appear to show that new communication technologies are persistently finding their place in the “mediatisation” of interpersonal communication, although they rarely displace the existing ones. Rather, new media add to the available options new communication alternatives, which to some extent prompt more frequent and/or specialised uses of different interpersonal communication channels.

Introduction

Recent developments in information-communication technology hardware and software, data exchange protocols, compression technologies and the physical communication infrastructure have quickly made the mobile phone, the Internet, and short text and multimedia messages viable communication technologies used by a great proportion of people (e.g., Glotz et al., 2005; Castells et al., 2006; Katz, 2006; Morley, 2007). Hence, at least in today's Western World these “new” interpersonal communication technologies play in combination with traditional face-to-face communication and “older” technologies such as the fixed telephone an increasingly important role as media for everyday interpersonal communication. These “new” interpersonal communication media are being used on a large and still increasing scale also in Slovenia so that some of them (i.e., the mobile phone and short text messages) in the 2006 almost reached the penetration rate¹ of the fixed telephone. As these communication

¹ While in 1997 only 13 % Slovenians used the Internet and the percentage of mobile phone users was even smaller and did not exceed 8 %, nine years later, in the first quarter of 2006, 54% of persons aged from 10 to 74 years regularly used the Internet, whereas the percentage of mobile phone users was 86% (Statistical Office of the Republic of Slovenia, 2006). These ample changes had also important implications on the use and penetration of the fixed telephone in households. In the late 1990s, Slovenia was one of a few countries in

technologies are quickly becoming an integral part of our everyday interpersonal communication landscape, explaining who uses them, for which purposes, and to what extent is important – at least under the widely accepted fact in social sciences that interpersonal communication is a media of social integration, cultural transmission and identity building (Habermas, 1984).

Historically when new information and communication technologies appeared scholars have always been fascinated by them. As a result several studies can be identified that have examined different aspects of use of every of the above mentioned mediated communication technologies – the fixed telephone (e.g., Pool, 1977; Singer, 1981; Fischer, 1992), the Internet (e.g., Baym, 1995; Jones, 1995; Katz and Aspden, 1997), and lately the mobile phone (e.g., Katz and Aakhus, 2002; Katz, 2003; Fortunati et al., 2003; Ling and Pedersen, 2005; Glotz et al., 2005). All of these and a glut of other not cited studies offer precious, qualitative and quantitative insight into interpenetration of communication technologies with their users and surrounding social contexts. However, we are currently lacking studies that would consider the totality of various technologies present in everyday communication decisions and activities. Our aim was thus to analyze what people do with all the interpersonal communication technologies that contemporary society offers them and for what activities are they used.

Such question seems to fit best in the context of the uses and gratification approach, which is, as Ruggiero (2000) argues, suitable for analyzing such a complex media environment, within which social actors combine face-to-face communication, the use of traditional (i.e., the fixed telephone) and contemporary communicating technologies for satisfying their communication goals. It is thus of no surprise that we have recently witnessed a revival of the uses and gratification approach, which is claimed to be a useful and fruitful framework for studying new communication technologies, especially by internet researchers (Rubin, 1994; December, 1996; Morris and Ogan, 1996; Flanagin and Metzger, 2001).

Nevertheless, Flanagin and Metzger (2001) claim that only little uses and gratifications research has addressed the issue of choosing “new” communication technologies in conjunction with other, “old” ones, yet “it is a crucial one for gaining a better insight into the uses people have for new communication systems” (Flanagin and Metzger, 2001: 158). If we want to accomplish this goal, one has to be aware that the uses and gratification approach has its conceptual and methodological limitations. Some of them were already pinpointed in the seminal introduction of perspectives on this approach, entitled *The Uses of Mass Communications: Current Perspectives in Gratifications Research* (Blumler and Katz, 1974), and later repeated and extended (see Ruggiero, 2000). We will thus first propose an alternative and more concise analytical framework mostly based on ideas from Habermas’s theory of communicative action in order to overcome some of uses and gratification deficiencies and make it more appropriate for a comparative analysis of the uses of “old” and “new” interpersonal communication technologies. The developed four-dimensional typology of social use will then be applied as a basis for an outline of different uses and gratifications,

Europe where the percentage of households with the fixed telephone exceeded 90 %. Precisely, in the year 2000 96 % of Slovenian households had the fixed phone (Public Opinion and Mass Communication Research Centre, 2006). After the proliferation of mobile phone, which reached its saturation at the end of 2006, a substantial smaller percentage (88 %) of households had the fixed telephone (Statistical Office of the Republic of Slovenia, 2006).

ascertained by existing “comparative” studies² in the field of uses and gratifications research. Moreover, since Dobos (1992) concluded that the uses and gratifications approach should prove effective in ascertaining the importance of social context as a factor in the communication experience, we discuss how social uses of communication technologies differ accordingly to social structure variables such as gender and internet use. Finally, as the aim of this study is to get an applied grip on the gendering of interpersonal communication technologies, the effect of internet use as well as the general use of interpersonal communication channels, the results of an empirical investigation, carried out on a representative sample of Slovenian population, are presented in the final part of the paper.

Research Framework: The Four-dimensional Typology Of Social Use

Although the uses and gratifications approach was first put forward in the field of mass media-choice research (Katz et al., 1973; Blumler and Katz, 1974), its premises of individuals as active media users also proved useful as well as insightful in the research of mediated interpersonal communication (e.g., Rubin, 1988; Dimmick et al., 1994; O’Keefe and Sulanowski, 1995; Dimmick et al., 2000; Leung and Wei, 2000; Leung, 2001; Flanagin and Metzger, 2001; Flanagin, 2005; Wei and Lo, 2006). It is thus not surprising that we are beholding a revitalization of this research stream in today’s media-saturated world (Morley, 2007), where social actors are not only confronted with a variety of media and media content, but also with a extensive array of media for interpersonal communication. If until recently “old” (i.e., the fixed telephone, pager) and “new” (i.e., the mobile phone, PDAs, and the Internet) modes of electronic communication served in a supportive and supplemental role to overly dominant face-to-face communication in everyday life, we are now entering an era of major structural change, where this complex media ensemble is itself becoming the very infrastructure of everyday interpersonal communication activities. In other words it seems that we are witnessing a transformation from a state, where face-to-face is a default medium of interpersonal communication, which would only be substituted by other channels when it is not available (due to time-space limitations) to a state of interpersonal media pluralism, where people’s choice of appropriate medium for interpersonal communication bases on their beliefs and feelings how well choosing a certain medium will satisfy their needs. Such a state, where people use various media at different times for various reasons seems best suited for uses and gratifications approach.

However, reflecting the central assumptions that framed the original approach of uses and gratifications, and especially some of their implications in the research of mediated interpersonal communication, it can be ascertained that they have been often seriously criticized (Elliot, 1974; Carey and Kreiling, 1974; Ruggiero, 2000; Swanson, 1977; Lomati et al., 1977). These shortcomings have been even more evident and relevant in the recent two decades when researchers have been busy applying the uses and gratifications to a wide range of newly popularized communication technologies. This trend toward enlarging the array of technologies included in single studies as well as the scholar’s inclination to refine theories concerning motivations toward media use also yielded a set of conceptual and methodological problems that turned out in a quite muddled overall picture of the uses of information and communication technologies for everyday interpersonal communication. Accordingly, the intention of this paper is not to establish a new uses and gratification framework oriented toward the identification of a larger number of uses and gratifications

² The term *comparative studies* refers to investigations that examined and compared the uses and gratifications of various interpersonal communication channels simultaneously.

dimensions, but, on the contrary, only to offer slight yet necessary reconceptualizations with the purpose to systematically present existing uses and gratifications of interpersonal communication technologies in a common conceptual terminology and on this conceptual typology present an empirical research that will allow us to answer the above stated research question. We thus present an slightly reconceptualised analytical framework of uses of interpersonal communication technologies that is still based upon existing assumptions, but focuses on a segment that seems to be overlooked and somewhat trivial in the uses and gratifications approach – the notion of “use”. We believe that a theoretical framework in which the use of media is conceptualized as social action can move uses and gratification approach from the utilitarian to a socially contextualized position as well as resolve its existing terminological inconsistency.

Drawing on theory of communicative action, in which Jürgen Habermas (1984) developed one of the most comprehensive and refined typologies of social action, exemplified by Petrič (2006) in his conceptualization of social uses of internet, we thus propose a typology of uses of interpersonal communication media as social actions. Applying the theory of communicative action (Habermas, 1984) we can distinguish the uses, as follows:

- a. Expressive use: Use of interpersonal communication media for expressing speech acts that relate to the subjective world of personal experience, desires and beliefs. Such use is manifested in exposing one’s identity, presenting self, intimate communication and other forms of expressing one’s inner states.
- b. Relational use: Use of interpersonal communication media for expressing speech acts that relate to social relationships, interpersonal norms and other elements of interpersonal relations. It is manifested in the activities of establishing and maintaining social relationships, giving and receiving social support, friendship etc.
- c. Informational – cooperative use: Use of interpersonal communication media for expressing speech acts that relate to the objective world of facts and artefacts and is realized as giving and receiving information, working on a common project, transmitting knowledge.
- d. Strategic use: Use of interpersonal communication media for conscious or unconscious attainment of personal goals, maximizing the effectiveness of one’s actions where other communicators serve as means to one’s ends and not as actors with their own purposes and meanings in communication. It is manifested in satisfying practical goals, organizing things, scheduling, escape, deception, surveillance, and control.

This typology can be used for an overview of “comparative” studies of uses and gratifications of interpersonal communication technologies, as the gratifications that other researcher identified can unambiguously be projected to one of the four uses, which will be shown in the following sections. When we tried to map the existing comparative studies of uses and gratification of interpersonal communication media in the proposed typology of four social uses, we were considering the above definitions as the major criteria. We first of all took a motive, need, use or gratification in documented study, then investigated its informational – cooperative, strategic, relational or expressive orientation, and finally put the need, motive, use, or gratification into one of the four proposed categories of social use accordingly to its identified orientation.

Choice of communication media in Complex media environment

Before delineating the motives, needs, uses, purposes, gratifications, of current interpersonal communication technologies that were found by the “comparative” studies on uses and gratifications and applying them to the presented four-dimensional typology of social use, it has to be noted that this discussion cannot be (and has not been) separated from the face-to-face communication and its “uses” and “gratifications”, especially if one of the research problems is to investigate the functional alternatives (Lichtenstein and Rosenfeld, 1983; 1984; Perse and Courtright, 1993; Flaherty et al., 1998; Westmyer et al., 1998; Papacharissi and Rubin, 2000; Flanagin and Metzger, 2001; Flanagin, 2005). Within the field of uses and gratifications of interpersonal communication media it is thus not difficult to find “comparative” studies that take as a denominator the face-to-face communication. Face-to-face is the most “human” and natural way of communicating and it theoretically and empirically covers all of the proposed uses. For instance, Rubin et al. (1998) documented: (1) strategic uses (when talking about fostering favourable impressions and protecting vulnerabilities); (2) informational - cooperative uses (when talking of constructing and validating conjoint worlds); (3) relational uses (when talking of organizing relationships); (4) expressive uses (when talking of expressing feelings and thoughts). A subsequent review of the communication motives and uses led to the identification of a number of interpersonal communication gratifications. But although they generally expose a high variety of uses and cover a wide plethora of human motives and gratifications that stem from obtaining them, they are specimens or sub-dimensions derived from the four proposed types of social use.

The obviously rich tradition of uses and gratification approach is far more modest when the focus is on the “comparative” studies that beside face-to-face communication considered also other (especially new) interpersonal technologies, yet this is probably the most intriguing part of research in today’s total media environment that has been deluged with dozens of technologies (e.g., e-mail, instant messaging, internet phone, PDA, the fixed telephone, the mobile phone, SMS, MMS). First comparative studies that, for instance, analyzed the choice of e-mail, and video conferencing in comparison with other media (i.e., the fixed telephone, letter, memo, fax), and face-to-face interaction in the specific context of organizations, already appeared in the late 1980s and early 1990s (Daft and Lengel, 1984; Webster and Trevino, 1995; Fulk, 1993; Trevino et al., 2000; Rice, 1993). However, organizational communication research has only focused on the ability of communication technologies to address instrumental tasks. Hence, it provided only limited insight into how the processes of an overall “mediatisation” of everyday life’s interpersonal communication are affecting people’s communicative practices, which in many aspects differ considerably from those in organizations and institutions.

Perse and Courtright (1993) were among the few researchers who at that time moved the focus away from the organizational settings and concentrated on people’s uses of the computer-mediated communication in comparison with other mass media channels and face-to-face conversation in the broader social context. Considering that they investigated uses of “computer” generically, without isolating any of its specific functions, they found that computer was rated low in social presence and not strong at accommodating relational or expressive uses. In part, Perse and Courtright attributed their findings to the low diffusion of computers and the low adoption of e-mail and bulleting boards. A half decade later, when the lack of exposure and access to the Internet were no longer such limiting factors Flaherty et al. (1998) in a preliminary investigation of the Internet as a functional alternative to face-to-face communication examined the relationships between motives for using the Internet and

motives for face-to-face interactions. Results indicated that use of the Internet among students was not perceived as a functional alternative to face-to-face communication. The latter was positioned as the most preferred way to fulfil communication needs and achieve all social purposes. Similar types of social use were ascertained in study conducted by Westmyer et al. (1998). They examined perceived appropriateness and effectiveness of e-mail and five other communication channels, including face-to-face interaction and the fixed telephone, used in relation to several interpersonal communication motives (i.e., inclusion, affection, control, relaxation, escape, pleasure) in other-directed and self-directed need fulfilment situations. Face-to-face communication was found to be the most appropriate and effective channel for communicative needs given and received, while the telephone was, in almost all instances, an equal, but less used functional alternative. E-mail and other channels were possible, in many instances, as a third or fourth choice. Obviously, when given the opportunity to choose the channel for interpersonal communication, people preferred oral communication (i.e., face-to-face, and the fixed phone) over written communication (i.e., e-mail, letters, etc.). Dimmick et al. (2000) focused on the patterns of uses of e-mail and the fixed telephone and assessed that a wider spectrum of needs is being served by the fixed telephone, whereas e-mail provides greater opportunities for strategic use. While respondents looked at the fixed phone and e-mail as two competitive media for sustaining particular relationship activities, they were not seen as close substitutes since e-mail was viewed as not particularly helpful in providing the sociability gratifications of companionship, advice and care (i.e., relational uses).

Similarly as the housewives began to use the telephone in the first part of 20th century for sociability matters (Singer, 1981; Fisher, 1992; Joinson, 2004), the mobile phone changed its original role from business tool to communication device for relational use and thus become an important companion of face-to-face communication. Ishii (2006) for instance discovered that the fixed phone, the mobile phone, e-mail, and face-to-face conversation are basically all used for expressive and relational purposes, although some unique features specific to mobile communication channels use in comparison to the fixed telephones and e-mail existed. More specifically, on the one hand short text messages and mobile voice calls appeared to support only a closed friendship network, whilst e-mail was found to promote relational oriented communication with distant friends. On the other hand, compared with other media, the fixed phone was more closely associated with relational uses in domestic environment. Likewise, Cummings et al. (2002) found in their comprehensive research based on students' interaction diaries that the fixed telephone and face-to-face meetings were perceived most suitable for relational use, whilst the Internet was rated lowest for maintaining relationships, and better for arranging school work and exchanging information, the latter two corresponding to informational – cooperative type of social use.

Finally, results of the study carried out by Flanagin (2005) suggested important differences among interpersonal communication technologies. Similarly to Westmyer et al. (1998), he identified face-to-face communication as by far the niftiest channel for satisfaction of all gratifications, suggesting that despite a growing number of increasingly complex and powerful media choices, nothing appears to threaten the dominant role of face-to-face communication in terms of satisfying individuals' communication, information, and social needs. Although some caution is needed when interpreting the usage patterns of the fixed telephone due to the specific sample of students, who use the fixed telephone less frequently than other age groups do, Flanagin concluded that unlike most previous studies, in this one the fixed telephone was found the least useful communication technology for need satisfaction. Likewise, e-mail was also ranked low on all gratifications factors, more so on

relational ones. By contrast, both the mobile phone and instant messaging were used significantly more than e-mail for all social purposes, consistent with previous research (Ramirez et al., 2004) showing that instant messaging is viewed more effective than e-mail for both strategic and relational uses, if we succumb to our typology of uses. Finally, although Flanagin (2005: 183) concluded that “overall, differences between instant messaging and the mobile phone are statistically insignificant, indicating higher functional equivalence between these two media”, his research showed that the latter was more used for relational and informational-cooperative purposes, whilst the former was mostly for specific relational use (i.e., meeting new people).

To put it in a nutshell, the overview of the “comparative” uses and gratification research revealed that face-to-face communication has been only partially displaced by various “new” information and communication technologies. As Joinson (2004) suggests, in certain technologically saturated social environments as well as for certain groups of individuals that share specific socio-psychological features the mediated communication has surely become a desirable mode of communication, but this is far from being a general regularity. To contextualize these findings with the recent developments and high appropriation of “new” communication technologies in Slovenia, we set ourselves to empirically research the following questions:

RQ1: Which communication technologies are being used for similar social purposes?

RQ2: Which communication technologies are most frequently brought into play for a particular type of social use?

Gendering of Interpersonal Communication Technologies

Cockburn (1993) suggested that the adoption and usage of communication technology is socially conditioned, as technology is deployed and later used in environments with different social and cultural milieu, which entail an array of diversified social relations. Social groups experience a given media technology differently due to the differences in social structures. Gender exemplifies such differences. Past empirical research reported significant gender differences in the use of the fixed telephone, the Internet, the mobile phone, and short text messages. In a review of research literature on gender and the fixed telephone, Fisher (1992) presented extensive evidence that women have what he called affinity for the fixed telephone. He suggested that there is a relationship between gender and the use of the fixed telephone. Fischer (1992: 234-235) discussed three reasons that may provide a valuable explanation of gender difference in the social uses of the telephone. First, women who work in the home may exploit the fixed telephone for breaking the isolation and monotony they experience during the day. Second, married women have usually had the role of social manager in the household, which included organizing functions and socially oriented tasks such as making appointments and staying in touch with family, kin, and acquaintances. Third, he argues that North American women are more comfortable on the fixed telephone than are men since the social role of women requires more sociability. Other historical analysis (Martin, 1991; Pool, 1977) reached similar conclusions. Using the fixed telephone more and talking longer, women used it primarily for relational and expressive purposes, such as to keep in touch with family and friends, to exchange information about the events in community, and to keep them company (Smoreda and Licoppe, 2000). Furthermore, Fortunati (forthcoming) found that in Italy women significantly more than man call just to know how is the called, to chat, to talk about personal or family problems and to confide their secrets, whilst men declare more than firsts to call for none in particular, and to talk about work issues. Finally, focusing on

females' use of the fixed telephone in small community, Rakow (1992) identified in the fixed telephone a particular useful device for women who were more likely to experience isolation, loneliness, fear, or boredom. Her study concluded that the fixed telephone "builds and maintains relationships and accomplishes important care-giving and receiving" (Rakow, 1992: 151).

Recently, scholars also examined if there are any gender differences in the use of the mobile phone and short text messages. In a study conducted on a sample of mobile phone users in Hong Kong Leung and Wei (2000) found that those respondents who called their co-workers and business partners appeared to be mostly males. Wei and Lo (2006), basing on a survey of Taiwanese college students, ascertained that females made and received more family-oriented as well as social-oriented calls. In addition, they found that men and women differed significantly in seeking the gratifications of information-seeking, affection, and mobility. Females tended to use the mobile phone for expression and affection and to take advantage of mobility of wireless technology, whereas males appeared to use the mobile phone to seek or retrieve information. Thus, Wei and Lo (2006) concluded that gender mediates how users exploit the mobile phone to establish and maintain social ties. As what regards the appropriation and the use of short text messages in the context of gender differences, Ishii (2006) pointed out how Japanese teenaged girls found that relational-orientated communication needs, including the needs of hyper-coordination with friends and family members, of chatting, and of gossip, were better served by texting than by mobile voice calls. This finding echoes that of Ling (2004), who suggested that the culture of texting lives among younger female users. Results of his study showed that females were more "adroit texters" (Ling, 2004: 165), especially prone to send emotionally based "grooming" messages oriented toward relational and expressive purposes, although they also exchanged "strategic" messages more frequently than males did.

More broadly, gender differences were studied in computer-mediated communications (ranging from e-mail, listserv, newsgroups, bulleting boards, and web forums to chat rooms) focusing on issues of access to, and use of internet applications, contents, and resources. Herring (2001) as well as Ono and Zavodny (2003) argued that access was a stumbling block for women during the most of 1990s in countries all over the World. In the Western World this gender gap in being online was gradually bridged as more women went online, accounting for 51 % of internet users in Slovenia in 2006 (Statistical Office of the Republic of Slovenia, 2006). However, once online, this did not mean that differences in patters of internet use between men and women disappeared. On the contrary, several studies suggested that on the social uses of the Internet become to differ along the gender line. For example, Hoffman et al. (1996) found that women tended to exchange more private e-mail than participate in public discussions on web forums, or in chat rooms. Herring' study (2001) indicated that, albeit women frequently participated in online opportunities such as women-centred groups, they generally posted fewer and shorter messages, received fewer responses from other participants, and were not interested in the development of discussions. Likewise, Weiser (2000), referring to the uses and gratifications approach, ascertained that males' and females' usage styles of the Internet appear to differ. If we apply the insights of his study to our typology of social uses, it can be ascertained that males showed a tendency to use the Internet primarily for strategic purposes (i.e., leisure and entertainment), whereas females use it chiefly for relational activities. More recently, this differentiation in strategic and relational uses of the Internet along the gender line was also suggested by Jackson et al. (2001), who found that on the one hand females, due to their stronger motive for interpersonal

communication, used e-mail more than males did. On the other hand, males used the Web more than females did, consistent with their stronger motive for information.

Will these gender differences be found in four types of social use of the mobile phone, short text messages, the fixed telephone, face-to-face communication, and the Internet? We raise the third research question as follows:

RQ3: Are there gender differences in the four types of social use of five communication channels?

Internet and Communication Technology Use

Moreover, this study will also explore whether the use of the Internet promotes a more frequent interpersonal communication through all communication channels among social actors. Albeit Baym et al. (2004) blasted the epistemological approach, which sees the internet as a single entity that influences its users through sheer exposure, they ascertained that “a common strategy in assessing the social and personal communication consequences of the internet has been to compare people based on their amount of internet use” (Baym et al., 2004: 300). Many of the most influential and widely-publicized studies of the Internet’s role in sociability compared internet users and non-users, heavy and light users, or experienced and new users. The findings were mixed. Scholars often claimed that the Internet has a positive influence on frequency of interpersonal communication because it lowers the communication barriers in space and time. It thereby increases the efficiency and speed social activities, thus saving time for other activities including face-to-face communication. For example, Baym et al. (2004) reported that the Pew Project on the Internet and American Life carried out in 2000 found that internet users were more likely than non-users to have visited family or friends ‘yesterday’, and that they spent more time with clubs and volunteer organizations. Robinson et al. (2002) examined time-diary data and ascertained that internet users spent three times more time attending social events and reported significantly more conversation than non-users. Moreover, Rheingold (1993) and more recently Gershuny (2002) suggested that the Internet also offers new opportunities for relational and expressive uses, with which internet users may build new links and communities of interests and emotion. Additionally, the Internet may change existing communication networks, since people use it to maintain contact with existing community members, either by adding it to other contacts or by completely shifting the communication to the Internet (Wellman et al., 2002). On the other hand, many authors support a less optimistic view of the Internet’s social impact on interpersonal communication. For example, Kraut et al. (1998), and Nie and Erbring (2002) associated internet use with negative social outcomes ranging from less time spent with family and friends to less total social involvement. Furthermore, Putnam (2000) claimed that interpersonal relationships established on the Internet were neither sufficiently rich and strong nor enough substantial and sustaining. As a consequence, the Internet can not take the place of the traditional face-to-face social networking. Nevertheless, previous research also showed that most online interactions happened between people who also heavily used other communication channels (i.e., the fixed telephone and face-to-face communication). The study, carried out by Baym et al. (2004) on a sample of students, demonstrated an online social life that was both connected to communication in other media and had its own limited but pervasive use in interpersonal communication. Students, who reported more frequent on-line interpersonal communication, were also more likely to use face-to-face conversations, telephone calls, and mail. Hence, Baym et al. (2004) concluded that on the one hand internet use fosters newer, more frequent and diverse, but also less

intense contacts. On the other hand, it also promotes more intense off-line communication (through other communication channels) with people who are already a part of users' communication network. Recently, a large-scale study on the social support networks of internet users done by Hlebec et al. (2005) in Slovenia, ultimately confirmed those insights, indicating that internet use has a relatively limited impact on social relationships and does not radically alter the structure and characteristics of interpersonal communication.

In sum, the empirical evidence does not support any simplified conclusions or on-sided interpretations as regards the use of the Internet and other new and traditional communication technologies, with respect to the frequency of use of communication channels for different types of social purposes. These equivocal results and conclusions of previous studies lead us to our last research question:

RQ4: Are there any differences in the frequency of social uses of interpersonal communication technologies between internet users and non-users?

Method

Procedure

Data presented in this study were drawn from a larger IKT-GOS 2005 survey, which was part of Slovenian application of Eurostat survey on information-communication technology. The IKT-GOS 2005 survey was thus conducted in the frame of the Eurostat guidelines for 2005 European Union survey³ and in accord with standards of the Statistical Office of the Republic of Slovenia. The purpose of the survey was to measure the usage of computers and other information-communication technologies. The questionnaire was divided into two parts. In addition to the harmonized Eurostat part of questionnaire, which was conducted in all 25 European Union member states, three 20 minute modules were added on social aspects of the fixed telephone, the mobile phone, and the Internet. The fieldwork was conducted by Centre for Methodology and Informatics at the Faculty of Social Sciences, University of Ljubljana.

Sample and Response Rate

The units were persons aged 10 to 74 and their households. The selected persons should answer for themselves, but if they were absent, some other household members could answer the key questions instead of the selected persons (proxy respondent). There were almost no proxies for mobile phone module. The basis for the sampling frame was the Central Population Register (CRP). The face-to-face survey was performed from 4 April to 31 May 2005 and after a lot of efforts (follow ups, refusal conversion) the response rate was relatively high. In the initial sample size of 2,000 units there were 1,827 eligible units and 1,422 persons took part in the survey. That means that the response rate was 77.8% and the eligibility rate was 91.4%. The non-response rate was 22.2% and the refusal rate was 12.1%.

To reduce the drop out, which could be caused by the considerable length of the questionnaire, only half of interviewees, who took part in the survey, were supposed to answer all three modules in the second part of the questionnaire. Moreover, respondents were also given the opportunity to skip sections in the specific module, if they "never used" the

³ The international data are available on Eurostat Home page: <http://epp.eurostat.ec.eu.int>, Themes Science and Technology, Data Information Society Statistics.

technology in question. Therefore, the final sample was 651 and is treated as a representative sample of the general population of Slovenian adults. The sociodemographic structure is similar to the 2002 Slovenian census (Statistical Office of the Republic of Slovenia, 2006). 50.8% of the respondents were men, 15.5 % had some university education, 45.3 % of them were employed, and 20.1 % attended school (primary, secondary, university). The range of respondents ages was 10 to 74 years, with a mean age of 42.1 years (SD = 17.9).

A great majority (88 %) of the respondents had access to a desktop computer or a notebook in their household, 375 (57.6 %) respondents had used the computer in the last three months. Out of 651 respondents, 353 (54.2 %) had access to the Internet in their household, and 337 (51.8 %) had used the Internet in the last three months. Among the 337 internet users, 202 (59.9 %) used it every day (or almost every day), 96 (28.5 %) used it at least once a week, and 32 (4.9 %) reported using it at least once a month. 586 (89.4%) respondents in the sample had a fixed phone in their household, whereas 556 (85.4%) respondents were mobile phone users. Among the 556 users, 496 (89.2 %) had their own mobile phone, and 44 (7.9 %) reported owning two or more. Furthermore, 213 (38.4 %) mobile phone users made or received one to four calls in a typical working day, 115 (20.7 %) daily send and received short text messages, whilst 79 (14.2 %) had never used multimedia messages.

Instrument and Measures

The four different uses of interpersonal communication media were operationalized by single statements, which were used separately for four different communication technologies (the mobile phone, SMS/MMS, the fixed telephone, and internet's interactive services) and for face-to-face communication. These statements were derived from the definitions of the four uses and reflected the intensity of use (as an action) of a certain technology for certain communication needs or gratifications. For example, the measurement instrument for four different uses of the fixed telephone was the following:

- a. Expressive use: "How often do you use the fixed telephone for talking about personal-intimate matters"⁴?
- b. Relational use: "How often do you use the fixed telephone to chat, socialize and other secondary matters?"
- c. Informational-cooperative use: "How often do you use the fixed telephone to talk about work, business and school matters"?
- d. Strategic use: "How often do you use the fixed telephone to talk about everyday practical matters?"

These statements were then repeated in the separated questionnaire modules for face-to-face communication and all other mentioned communication technologies. The decision for single statements stems from practical rationale - since our measurement instruments were only a part of a much broader, but representative Eurostat survey where we had to consider the possible effect of non-negligible length of the questionnaire and respondents fatigue, and thus had to make some unpleasant reductions⁵. Nevertheless, we could argue that our

⁴ Respondents answered for each statement on a five point scale, where 1 = "never" to 5 = "daily".

⁵ If we would for instance decide to measure each use with 2 statements, this would result in additional 4 (uses) x 5 (technologies) = 20 statements.

measurement instruments are theoretically valid, since they correspond well to the definitions of theoretical concepts from which they were derived⁶.

Results

The first research question concerned similarities in communication technologies use, which were assessed by a series of paired samples t-tests. Results in Table 1 show that the mobile phone was the most frequently used for strategic activities, which were followed by relational and informational - cooperative ones. Short text messages were significantly the most frequently exchanged for strategic and relational uses. Moreover, the mean values of frequency of texting indicated that respondents exchanged messages significantly the least frequently for informational - cooperative activities and expressive activities. Similarly to the mobile phone and short text messages the fixed telephone was also significantly the most frequently used for strategic activities, whilst informational - cooperative and relational activities were the second most frequently carried out communication activities by fixed telephone users. Respondents utilized face-to-face communication the most frequently for their strategic and relational uses and the least often for exchanging expressive messages; the latter also applying to the Internet. The Internet was the most frequently used for informational - cooperative, strategic, and relational activities, the first being significantly more frequently carried out than the latter. Together, these results indicate that four out of five communication channels were most commonly used for strategic activities, whereas all five communication channels (including the Internet) were rarely used for carrying out expressive activities.

Table 1: Mean Ratings of Frequency of Use of Technologies for Communication Activities - Comparison by Communication Activities (Paired Samples t-test)

<i>Type of social use</i>	<i>Mobile phone</i>	<i>SMS/MMS</i>	<i>Fixed telephone</i>	<i>Face-to-Face</i>	<i>Internet</i>
	<i>N = 539</i>	<i>N = 533</i>	<i>N = 628</i>	<i>N = 638</i>	<i>N = 318</i>
informational – cooperative	2.81	1.73	2.32 _a	3.25	2.57 _a
Strategic	3.83	2.32 _a	2.83	4.08 _a	2.33 _{ab}
Relational	3.07	2.18 _a	2.40 _a	4.04 _a	2.28 _b
Expressive	1.92	1.54	1.54	2.75	1.40

Note: Means with matching subscripts within the same *column* are *not* significantly different from one another. Significant differences are at $p < .01$. 1 = never, 5 = daily use.

In order to answer the second research question that sought to discover which communication technologies are the most frequently employed for specific type of social use, paired samples t-tests were run, comparing the mean ratings of frequency of social uses across all communication technologies. The results presented in Table 2 indicate that face-to-face conversation was significantly the most frequently used channel for all four communication activities, whilst the mobile phone was significantly more frequently utilized for all four types of social use than all other three communication technologies. Furthermore, there were not found any significant differences in the frequency of short text messages and fixed telephone use for strategic, relational and expressive activities. Finally, texting was assessed as significantly the least often used technology for informational - cooperative activities, whilst the Internet was significantly the least frequently used technology for exchanging expressive messages.

⁶ Some caution is needed when interpreting the strategic use of interpersonal technologies. While the concept of strategic use includes wide variety of personal goals (practical goals, organizing things, scheduling, escape, deception, surveillance, control), the indicator used covers only a limited spectrum of a concept.

Table 2: Mean Ratings of Frequency of Use of Technologies for Communication Activities - Comparison by Communication Technologies (Paired Samples t-test)

Type of social use	Mobile phone	SMS/MMS	Fixed telephone	Face-to-Face	Internet
informational – cooperative	3.34	2.04	2.98	4.09	2.61
Strategic	4.09	2.78 _a	2.90 _a	4.34	2.33
Relational	3.35	2.56 _a	2.50 _{ab}	4.25	2.29 _b
Expressive	2.14	1.72 _a	1.69 _a	3.04	1.39

Note: Means with matching subscripts within the same row are *not* significantly different from one another. Significant differences are at $p < .01$. 1 = never, 5 = daily use. $N = 299$, means were calculated and paired samples t-test were performed on a sub-sample of respondents, who had access to all five communication channels.

The third research question was to find out if there were any differences in types of social use between males and females across all five communication technologies. The independent samples t-tests were run using social purposes managed by different communication channels as test variables and gender as grouping variable. As shown in Table 5 males significantly more likely used the mobile phone for informational – cooperative purposes, whilst females significantly more often made use of it for relational and expressive communication. Females also tended to use significantly more often short text messages for relational purposes, and the fixed telephone for all types of social use except for informational – cooperative ones.

Table 3: The Comparison of Mean Ratings for Frequency of Social Uses of Communication Technologies by Gender - Independent Samples t-test

Technology	Types of social use	Male	Female	T-values
mobile phone	informational – cooperative	3.07 (1.70)	2.54 (1.58)	3.70***
	strategic	3.76 (1.42)	3.90 (1.42)	-1.15
	relational	2.87 (1.58)	3.27 (1.62)	-2.90**
	expressive	1.72 (1.09)	2.13 (1.42)	-3.70***
SMS/MMS	informational – cooperative	1.70 (1.12)	1.76 (1.23)	-0.55
	strategic	2.25 (1.36)	2.40 (1.43)	-1.21
	relational	2.05 (1.31)	2.31 (1.48)	-2.08*
	expressive	1.45 (0.93)	1.63 (1.15)	-1.92
fixed telephone	informational – cooperative	2.29 (1.46)	2.34 (1.54)	-0.43
	strategic	2.60 (1.34)	3.06 (1.46)	-4.11***
	relational	2.11 (1.23)	2.70 (1.43)	-5.51***
	expressive	1.39 (0.71)	1.70 (1.12)	-4.09***
face-to-face	informational – cooperative	3.34 (1.66)	3.15 (1.74)	1.39
	strategic	4.03 (1.29)	4.14 (1.28)	-1.09
	relational	4.00 (1.34)	4.09 (1.30)	-0.86
	expressive	2.63 (1.37)	2.88 (1.41)	-2.22*
internet	informational – cooperative	2.54 (1.66)	2.59 (1.58)	-0.25
	strategic	2.27 (1.43)	2.40 (1.46)	-0.76
	relational	2.21 (1.43)	2.36 (1.39)	-0.98
	expressive	1.36 (0.86)	1.46 (0.97)	-0.99

Note: # $p > .05$; * $p < .05$; ** $p < 0.01$; *** $p < .001$. N ranged from 318 to 638. 1 = never, 5 = daily use.

The last research question was to find out if there were any differences in social uses of communication technologies between internet users and non-users. A series of independent samples t-tests were performed using types of social use across four communication technologies as test variables and internet use as a grouping variable. As shown in Table 5 internet users made significantly more frequently use of all interpersonal communication technologies for all four types of social purpose than internet non-user. The only exception,

where the difference between internet users and non-users was not statistically significant, was the strategic use of the fixed telephone. A more detailed investigation shows that the largest statistically significant difference between the two groups was in the informational - cooperative use of face-to-face conversations, whereas the smallest one was in the frequency of the fixed telephone use for relational purposes.

Table 4: The Comparison of Mean Ratings for Frequency of Social Uses of Communication Technologies by Internet Use - Independent Samples t-test

<i>Technology</i>	<i>Types of social use</i>	<i>Users</i>	<i>Non-users</i>	<i>T-values</i>
mobile phone	informational – cooperative	3.24 (1.62)	1.90 (1.35)	10.14***
	strategic	4.07 (1.33)	3.32 (1.47)	5.68***
	relational	3.38 (1.59)	2.42 (1.45)	6.94***
	expressive	2.15 (1.37)	1.43 (0.85)	7.38***
SMS/MMS	informational – cooperative	2.00 (1.31)	1.16 (0.47)	10.80***
	strategic	2.72 (1.42)	1.48 (0.88)	12.37***
	relational	2.55 (1.46)	1.38 (0.86)	11.63***
	expressive	1.72 (1.17)	1.16 (0.54)	7.58***
fixed telephone	informational – cooperative	2.86 (1.58)	1.57 (0.97)	12.65***
	strategic	2.91 (1.46)	2.73 (1.36)	1.61
	relational	2.50 (1.37)	2.28 (1.35)	1.99*
	expressive	1.67 (1.04)	1.37 (0.76)	4.21***
face-to-face	informational – cooperative	3.99 (1.42)	2.24 (1.53)	14.85***
	strategic	4.29 (1.15)	3.80 (1.41)	4.64***
	relational	4.23 (1.22)	3.78 (1.41)	4.26***
	expressive	2.98 (1.40)	2.43 (1.31)	5.12***

Note: # $p > .05$; * $p < .05$; ** $p < 0.01$; *** $p < .001$. *N* ranged from 533 to 638. 1 = never, 5 = daily use.

Discussion and Conclusion

The aim of this study was to analyse which new and traditional communication technologies people use in everyday interpersonal communication. Although, on the one hand, the theory of uses and gratifications has always provided a cutting-edge theoretical approach in the initial stages of each new interpersonal communication medium and offered a quite exhausting range of theoretical concepts, with which it tried to embrace the social and psychological origins of both the process of choosing a certain medium as well as the process of using it. On the other hand, this trend toward enlarging and refining theories concerning motivations toward media use also yielded a set of conceptual inconsistencies and methodological limitations, which in the final stage of mapping and explaining the constitutional processes of mediated communicated acts, as Ruggiero (2000: 14) argued, turned out in a fuzzy overall picture. Moreover, past research draw on the uses and gratification approach was usually examining the social uses of one technology after another. As our meta-analysis reveals, it has rarely moved towards simultaneously investigating a whole group of occasionally overlapping “old” and “new” interpersonal communication technologies in the context of their daily use. To fill this research void, this study did not only explore the uses of various interpersonal communication technologies simultaneously, but also presented an attempt to overcome deficiencies, distinctive of the uses and gratifications framework, in explaining how a given communication technology is used in the complex interpersonal media environment by providing a more condensed, but at the same time exhaustive, research framework consisting of four types of social use.

The proposed four-dimensional typology that allowed a more systematic overview of existing “comparative” studies on the uses and gratifications of various interpersonal communication

media appeared to be advantageous also on the empirical level since the results showed some interesting and unique characteristics of communication technologies usage patterns. Firstly, unlike the Internet, which was the most frequently used for managing informational – cooperative, and strategic activities, all other four communication channels (i.e., the mobile phone, short text messages, the fixed telephone and face-to-face communication) were the most often employed for exchanging messages related to strategic and relational uses. Independently of the communication technology, the least frequently managed communication goal was expressive matters. Secondly, consistent with earlier findings (Westmyer et al., 1998; Flanagin and Metzger, 2001; Baym et al., 2004; Flanagin, 2005), this study reported that albeit internet users were adept at using the Internet socially and had integrated it into their daily lives, face-to-face communication clearly remained their dominant mode of interaction. Furthermore, compared to other three communication technologies included in this study, face-to-face conversation was still the most frequently used channel for managing all four types of communication activities, followed by the mobile phone, the fixed telephone, and short text messages. Thirdly, in the study reported in this article gender differences were observed in types of social use across interpersonal communication technologies. As previous studies (Fischer, 1992; Smoreda and Licoppe, 2000; Fortunati, forthcoming; Rakow, 1992; Leung and Wei, 2000; Wei and Lo, 2006), also this study found that on the one hand males arranged more often work and personal matters thorough the mobile phone than females did. On the other hand females made use of the mobile phone and the fixed telephone more often for relational and expressive purposes, although they at the same time showed also a significant proclivity to use the latter for strategic purposes. A useful argument, which could help us to understand the origins of the women’s strategic use of the fixed telephone, is offered by Arliss (1991). In her summary of research on the role of women in the household she concluded that despite the large number of women who are employed outside the home, the daily maintenance of the home still rests on women’s shoulders. She observed that even working women continue to be permanently tied to domestic activities within their homes. As a corollary, female’s communication goals revolve also around instrumental and practical matters. Hence, the role of women in the household as domestic managers, conditioned by the spatial and temporal mobility between the work and the home, explains the higher strategic gratifications that women derive from the fixed telephone. Women use the fixed telephone for making appointments, ordering things to her family members, and conducting other household maintenance activities. Fourthly, the data revealed that all communication channels were used for all types of social purpose significantly more frequently by internet users than non-users. Hence, the results of this research neatly dovetail with insights provided by Baym et al. (2004) and Hlebec et al. (2005), who ascertained that internet usage enhances the frequency of all forms of mediated and unmediated interpersonal communication, even though for those who use the Internet new technologies are not viewed as an adequate replacement of face-to-face talk. Finally, the data reported in this study revealed certain evidence of functional displacements, as Flanagin and Metzger (2001) defined the systematic changes in the commonly shared practices and codes regarding the usage of different media. Namely, among respondents who were fully integrated in the nowadays complex interpersonal media environment (i.e., had access to all five communication channels) the short text messages and the fixed telephone were seen as functional alternatives for all types of social use except for informational – cooperative ones. Considering that a similar “supplement” role of texting in relation to the fixed telephone was also unveiled by previous studies (Ishii, 2006; Ling, 2004), we believe our findings underscored yet again how readily users have appropriated and co-opted new communication technologies, to meet their own interpersonal goals.

However, this study also showed that in terms of the utility of communication channels for arranging communication activities and satisfying communication needs, face-to-face communication was by far the most versatile channel for all four types of social use. Thus we found only limited support for the claims of some scholars, who suggested that in the process of the “mediatisation” of everyday life face-to-face and technologically mediated interpersonal communication may irreversibly converge as “many community ties are complex dances of face-to-face encounters, scheduled get togethers, dyadic telephone calls, e-mails to one person or several, and broader online discussions among those sharing interests,” (Wellman, 2001: 11). Rather, the here presented results bear out past “comparative” research, referring to the uses and gratifications theoretical framework (Perse and Courtright, 1993; Rice, 1993; Flaherty et al., 1998; Flanagin and Metzger, 2001; Flanagin, 2005), which typically found that face-to-face communication is extremely useful for satisfying a variety of needs and no other “old” as well as “new” technology seems to be able to compete with the rich involvement that face-to-face communication provides. In addition, the highest frequency of face-to-face contacts for all types of social use among internet users seems to confirm its superiority as the most common used communication mode. Hence, the mobile phone, short text messages, the fixed telephone, and the Internet seem to merely supplement frequent face-to-face contacts among communication partners.

Nevertheless, when the relation between traditional and new communication channels is considered, it is impossible to overlook how in a relatively short period of time the mobile phone, SMS texting, and the Internet have evolved from being as largely unrelated to other traditional interpersonal channels in terms of their need fulfilment to fundamentally interwoven with them. The findings of this study indicate that people are integrating these technologies, especially the mobile phone and texting, into their daily array of communication tools and using them to manage a variety of matters just as they use more traditional media and face-to-face communication. Notably, the mobile phone, immediately behind the face-to-face communication, scored quite high on all four types of social use, indicating a high utility for informational – cooperative and strategic as well as relational and expressive oriented social actions. Moreover, this study also presented certain evidence of functional displacements between the short text messages and the fixed phone, thus firming up the suggestion that short text messages once considered an odd communication technology, low in social presence and need gratification, now appear to be a rich multi-functional communication channel, which “has found a functional niche in our communication needs” (Ling, 2004: 155).

Taken together, this would suggest that the mediated interpersonal interaction through the mobile phone, short text messages, and the Internet probably adds a valued dimension to people’s social needs and settings within which they act, without necessarily challenging face-to-face communication and unmediated interpersonal relationships. Rather, new communication technologies add to the mix of communication modes available to social actors, providing new and alternative possibilities for mediated connectivity that to some extent prompt more frequent and/or specialised uses of different communication channels.

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**Television:
The Good, The Bad And The Unexpected Challenges Of ICT**

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Abstract

The rapid progress of the information technologies brings to the fore the issue of their impact on the global/regional/national/local communication environment. These processes will stimulate mass media to pass from an extensive into an intensive phase of development. A market-driven technological convergence is taking place throughout the media industries.

The combination of terrestrial broadcasts with cable and satellite TV towards the households on *EU* territory is expected to grow into a strongly competitive environment, allowing for program, technical and financial backup. Digital compression of the spectrum already has opened up access to the widest possible range of programs (DVB-T, DVB-C, DVB-S, DVB-H) through the offer of many commercial and public services. Broadband (IPTV, xDSL), which enhances the individual selection of the programs, is now on the agenda. That is, the television actively moves towards diversification of the services on offer. It is becoming a service itself.

The type and pace of these changes may present *EU* citizens with challenges of many an aspect.

The paper examines the contemporary developments in television from several aspects: political, technological, economic, legal, social, professional. The analysis concentrates on the European media policies in line with the new *Audiovisual Media Services without Frontiers* Directive.

Introduction

In March 2000 the *Lisbon European Council* set up an agenda for economic and social renewal for Europe. Realizing that the continent is facing a paradigm shift driven by the globalization, the *EU* Heads of States and Governments agreed to make the *EU* "the most competitive, dynamic and inclusive knowledge-driven economy by 2010". It was noted then that "the knowledge economy is profoundly changing the types of skills required for work and that information technologies can help reduce long-term structural unemployment" (EC, 2000). In 2005, following the *Commission's* mid-term review of the Lisbon agenda, a comprehensive strategy for the Information Society 2005-2010 has been launched.

The "*i2010 – A European Information Society for growth and employment*" initiative was adopted by the *Commission* on 1 June 2005 as a framework for addressing the main challenges and developments in the sector of the information, communication and media industries up to 2010. The initiative contains a range of *EU* policy instruments to encourage the development of competitive digital economy such as regulatory instruments, research and

partnerships with stakeholders. It also emphasises ICT as a key driver of social inclusion and of better quality of life.

i2010 has three main policy objectives:

- to create a single European information space, which will secure an open and competitive internal market for the digital economy (electronic communication and media services) both for industry and consumers. Issues areas include: convergence, regulatory framework for electronic communications, roaming, radio spectrum, RFID, mobile TV, audiovisual media services, film/content online, copyright, media pluralism, media literacy, consumer protection, public sector information, electronic payment, electronic signature, security strategy, spam, safer internet.

- to strengthen investment in innovation and research in ICT and encourage the industrial application of ICTs. This includes issues addressing: ICT research in 7th Framework Programme, European Technology Platforms, Joint Technology Initiatives, innovation, take up of ICT by EU citizens, businesses and administrations - ICT Policy Support Programme in the Competitiveness and Innovation Programme, ICT Task Force, eBusiness, standardisation, pre-commercial procurement, eSkills.

- to foster inclusion, better public services and quality of life through the use of ICT. Issue areas addressed here are: eInclusion, e-Accessibility, broadband/digital divide, e-Government, eHealth, digital literacy, flagship initiatives: Intelligent Car, Digital Libraries, ageing/Ambient Assisted Living (in preparation), ICT for sustainable growth (in preparation) (EC, 2005).

The creation of common information space has been started with the modernization of the *EU* rules on audiovisual content services. Practices have demonstrated considerable progress: telecommunications providers are already offering broadcast services and content providers - communications services. The goal is the consumers to be able to watch audiovisual content anytime, anywhere, and on all technical platforms (TV set, computer, mobile phone, personal digital assistant, etc.). Broadband, triple play and quadruple play, fixed-mobile convergence, fibre rollouts, mobile TV are the new challenges to media markets. Next generation networks, capable of offering speeds that can support Internet and high definition TV (IPTV, VOIP, mobile TV, Web 2.0) are on the way. All this exiting variety of technological options and services needs the regulatory certainty of the developing common internal market for electronic communications (Reding, 2007).

Modern technologies have considerably facilitated collecting, storage, processing, and distribution of data volumes, reducing tangibly their entropy. However, under the conditions of this new communication environment orientation in the vast quantities of information is particularly important, as well as its rationalization and conversion into knowledge or as John Naisbitt put it: "*We swim in information, but starve for knowledge*" (Naisbitt, 1984, p.17). Which brings us to the "*informational paradox of more information = less information*" in the uncontrollable commercialization of the media (Cuilenburg, 1998, p. 81).

This gives rise to the question: How well the traditional media system with its main social pillars, such as plurality and diversity, fits into the newly developed situation, in which geopolitical boundaries become ever more conditional?

The perspective of mediamatics

Theoretical verification and legal regulation of the traditional mass media developments find difficulty to keep in pace with the headlong progress of new technologies. And if half a century ago Arthur Clarke's fantasies about a satellite communication ring had a strongly futuristic twang, in less than a decade digital technology brought revolutionary changes in the radio and TV production and dissemination processes all over the world. In a matter of

several years analogue communications will be a history. The type and pace of these changes will predetermine the further development of the Information Society and will present mankind with challenges of many an aspect. We are on the threshold of change of the very paradigm of the mass media system: technologically, financially, administratively, creatively and, above all, socially.

Of all factors affecting the building rate of the new type of society, the technological one is undoubtedly the most active. Arrangement and processing of information have been optimized and the speed of communication has increased. Mass-scale advent of digital electronics and computer software in the everyday life presumes introduction of new schemes and mechanisms for the creation, distribution and consumption of information. The range of traditional communication products and services is steadily expanding. Moreover, the satellite links, digitalization and new information technologies have brought to the fore the question of convergence in communications development on various levels. *“Convergence is a process, which in the coming decades may completely change not only the system of mass information and communication media, but also the various industries related to them”* (Vartanova, 2000, p. 39).

In its 1997 *Green Paper* the European Commission defined convergence as follows:

- ability to transfer kindred services on different platforms;
- bringing together of such large-scale public works as the telephone, television or personal computers.

The *Green Paper* also identified the basic characteristics of the Internet and the digital technologies that challenged the applied grounds for existing media regulation in a converged marketplace – the overcoming of scarcity, the interactive merge between publisher and consumer, the user-driven status, the decentralized (horizontal) communication. Thus, it prompted the media industries that in the vast growing technological era they would be predominantly governed by market mechanisms and economic objectives for achieving wider social, economic and general policy aims (EC, 1997, p. 18).

The *Green Paper* has set clear goals to convergence policy in audio vision. The information and communication technologies have outpaced regulation and have set up an economic basis for the convergence of entire industries: the electronic, entertainment, media. Along this sense Santiago Lorente sees two stages in technological development: *convergence between telecommunications and informatics (telematics) and between telematics and audio-vision (mediamatics)* (Lorente, 1997, p.119).

Being the backbone of the knowledge society, broadband is providing access to advanced public services and diverse multimedia content for information, entertainment, training and work. Broadband access has become a prerequisite for a wide range of issues - from economic growth to social inclusion. The main broadband technologies, relevant to media, include: xDSL (ADSL& VDSL), cable modem, fibre optic cable, power line communications, cellular solutions, W-LAN & Wi-Max, satellite solutions. The move to broadband fundamentally changes the Internet experience with new phenomena, such as “user generated” content sites and advanced “digital ecosystem” technologies. (EC, 2006).

It is the Single European Information Space pillar of i2010 that combines regulatory and other instruments for the creation of a modern, market-oriented regulatory framework for the electronic communications, stressing on the audiovisual policies, the radio spectrum management and the process of switchover to digital TV. In 2006 at the ITU’s Regional Radiocommunication Conference (RRC-06) in Geneva a treaty agreement was signed, according to which the transition period from analogue to digital broadcasting should end on June 17, 2015. The new digital Plan, based on broadcasting standards known as T-DAB (for sound) and DVB-T (for TV) will replace the analogue broadcasting plans existing since 1961 for Europe.

The switchover from analogue to digital broadcasting is expected to create new distribution networks and expand the potential for wireless innovation and services. The World Radiocommunication Conference (WRC-07), which will meet in the autumn of 2007, will deal with the regulatory aspects of the usage of the spectrum for these services. (ITU, 2006). Just prior to the reform of the EU telecom rules, on March 29, 2007 the *European Commission* published its 12th report on the EU's telecom market. It points out that although the consumers have more choice in a sector, worth almost €290 billion in revenues, the full potential of EU's internal market still remains unexploited (EC, 2007).

Despite the general progress of broadband developments, access to the new services in remote and rural regions appears to be limited because of high costs due to low density of population and remoteness. Having in mind all this, the *European Commission* published on March 20, 2006 the *Communication "Bridging the Broadband Gap"*, which refers to the territorial differences in broadband access, speeds, quality of service, prices and use between urban and rural/remote areas as well as between more/less developed areas in Europe (EC, 2006). This is a direct move towards protecting basic democratic achievements, such as freedom of expression and access to information.

Protection of media freedoms in Europe

Protecting freedom of expression and promoting media pluralism are among the most important democratic pillars in contemporary society. The necessity for sustaining these social achievements has been underlined as far back as in the first pan-European documents. In 1950 these intentions were outlined in Article 10 – Freedom of expression of the *Convention for the Protection of Human Rights and Fundamental Freedoms*:
1. Everyone has the right to freedom of expression. This right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers. This article shall not prevent States from requiring the licensing of broadcasting, television or cinema enterprises.

2. The exercise of these freedoms, since it carries with it duties and responsibilities, may be subject to such formalities, conditions, restrictions or penalties as are prescribed by law and are necessary in a democratic society, in the interests of national security, territorial integrity or public safety, for the prevention of disorder or crime, for the protection of health or morals, for the protection of the reputation or rights of others, for preventing the disclosure of information received in confidence, or for maintaining the authority and impartiality of the judiciary (CoE, 1950).

The *Council of Europe (CoE)* is the continent's oldest political organization, founded in 1949. Currently it groups together 46 countries. As the main intergovernmental organization at pan-European level, dealing with the democratic dimensions of communication, it has been consistently active in setting common standards for the media developments. The attention to these developments has become particularly strong since 1990's with the rapid progress of the information and communication technologies, which stimulated the media concentration process. This is in tune with *Council of Europe's* basic aims, such as:

- *to protect human rights, pluralist democracy and the rule of law;*
- *to promote awareness and encourage the development of Europe's cultural identity and diversity;*
- *to seek solutions to problems facing European society (discrimination against minorities, xenophobia, intolerance, environmental protection, human cloning, AIDS, drugs, organized crime, etc.);*
- *to help consolidate democratic stability in Europe by backing political, legislative and constitutional reform (Co E, 2007).*

In about half a century later Article 11 – Freedom of expression and information of the *Charter of Fundamental Rights of the European Union* reaffirms that:

1. *Everyone has the right to freedom of expression. The right shall include freedom to hold opinions and to receive and impart information and ideas without interference by public authority and regardless of frontiers.*

2. *The freedom and pluralism of the media shall be respected* (EU P, 2000).

The *European Union (EU)* is a supranational and intergovernmental union of 27 states. It was established in 1992 by the *Treaty on European Union* and is the successor to the six-member *European Economic Community* founded in 1957. The *EU* is one of the largest economic and political entities in the world, with 495 million people (Eurostat, 2007) and a combined nominal GDP of 11,294.6609 € (\$15,183.404) billions in 2007. (EU GDP, 2007). Citizens of *EU* member states are also *EU* citizens.

The *European Commission* is the executive body of the *European Union*. Alongside the *European Parliament* and the *Council of the European Union*, it is one of the three main institutions governing the *EU*. The primary role of the *European Commission* is to propose and implement the legal basis for the *EU*. The *Commission* is also responsible for adopting technical measures to implement legislation adopted by the *Council* and, in most cases, the *Parliament*. It monitors member states' compliance with the *Union's* agreed *Treaties* and *Directives*, taking action against those in default. The *Commission* is intended to be a body independent of member states. It consists of 27 Commissioners, one from each member state of the *EU* supported by an administrative body of about 23,000 European civil servants divided into departments called Directorates-General (EC, 2007).

The *EU Directorate General Information Society and Media* was expanded from January 2005 to include Media (formerly under *DG Education and Culture*). *DG Infso* deals with research, policy and regulation on the areas of information and communication technology and media. It defines and implements the regulatory framework for services based on information, communication and audio-visual technologies. Its regulation has cultural, societal and economic objectives, and covers some of the largest economic sectors in Europe. It furthermore fosters the growth of content industries, drawing on Europe's cultural diversity. *i2010 - a European Information Society for Growth and Employment* is currently the main ruling policy document of *DG Infso* (DG Infso, 2005).

The contemporary audio-visual policies

The acts of the *Council of Europe* important for the audio-visual developments are the legally binding European treaties or conventions, many of which are open to non-member states, as well as the acts of the:

- Parliamentary Assembly;
- Committee of Ministers;
- Steering Committee on the Media and New Communication Services (CDMC);
- The Standing Committee of Transfrontier Television
- The European Court of Human Rights

The different acts of the *Council of Europe* have different significance and different mechanisms for influencing the national legislature of the member states. The conventions are binding acts. Significant for the audiovisual sector are the *European Convention on Human Rights* and *The European Convention on Transfrontier Television*.

The *European Convention on Transfrontier Television* is a treaty, which was opened on May, 1989 for signature by Member States and by the other States Parties to the *European Cultural Convention* and by the *European Community*. May 1, 1993 marked its entry into force. Currently, the number of parties, brought to this instrument, is 31. The *Protocol* amending the

ECTT was opened for signing by the Parties to the *Convention*, in Strasbourg, on October 1, 1998. Since its entry into force on March 1, 2002, this *Protocol* has become an integral part of the *ECTT*.

The aim of the *Convention* is to facilitate, among the Parties, the transfrontier transmission and the retransmission of television programme services (CoE, 1989). It lays down a set of minimum rules in areas such as the responsibility of broadcasters in regard to programming matters, including the European content of programming; advertising, teleshopping and sponsorship as well as the protection of certain individual rights. For the major part, application of the *ECTT* relies on mutual co-operation between the Parties. A *Convention* body, the *Standing Committee on Transfrontier Television* composed of representatives of the Parties, is responsible for following the instrument's application and may intervene with advisory opinion for the friendly conciliation of any difficulties. In cases where disputes cannot be resolved through friendly settlement, arbitration is contemplated, resulting in legally binding decisions.

The *ECTT* and the amending *Protocol* from one side, and the *Television without Frontiers Directive*, from another, have similar objectives, although the intention of the *TVWF Directive* as an instrument of the *European Commission* is to create a common market in broadcasting.

The rapid technological developments in TV and radio broadcasting in the 1980's enhanced the launch of quite a number of private broadcasters. Soon the need of setting some minimum standards applicable in all Member States to regulate the rigorously developing TV and radio market was felt. Thus on October 3, 1989 the *European Union* came up with the *Television without Frontiers Directive 89/552/EEC*. This *Directive* constitutes the legal *EU* framework aimed at coordination of certain provisions laid down by law, regulation or administrative actions in Member States concerning the pursuit of television broadcasting activities. It aims to ensure the free movement of broadcasting services within the internal market and at the same time to preserve certain public interest objectives, such as cultural diversity, the right of reply, consumer protection and the protection of minors. It is also intended to promote the distribution and production of European audiovisual programs and to ensure that they are given, whenever possible, a majority position in television channels' program schedules. The general principle of the *TVWF Directive* is that member states must ensure freedom of reception and that they may not restrict retransmission on their territory of television programs from other Member States unless they infringe the *Directive's* provisions on the protection of minors (EC, 1989).

Only half a decade after the entry into force of the *TVWF Directive* the intense developments in the audiovisual sector determined the necessity of further extensions of the rules regarding some of its general provisions. These included: advertising, teleshopping and sponsorship; promotion and distribution of the European cultural productions; access the public to major (sports) events, protection of minors and right of reply.

Parallel to these actions, a report *Europe and the global information* (largely known as the *Bangemann Report*) proved to be extremely influential in starting the discussion on the future European communications policy, by pointing out that building the European information society would be market-driven. It also stipulated that a new regulatory environment allowing full competition in the area of digital developments and building new information infrastructures would be needed (EC, 1994).

Thus, on June 30, 1997 the *Directive 97/36/EC* of the *European Parliament* and of the *Council* amended *Council Directive 89/552/EEC*. Among the above mentioned provisions, it introduced a special article concerning the set up under the aegis of the *Commission* of a *Contact Committee*. It is composed of representatives of the competent authorities of the Member States with a task to facilitate effective implementation of the *Directive*. The

amended text of the *TVWF Directive* also stipulated that Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive not later than 31 December 1998 (EC, 1997).

In the process of implementation of the *TVWF Directive*, it is not possible to adopt decisions, contradictory to the norms of the *ECTT*. As an illustration of the co-ordinated actions of the *European Union* and the *Council of Europe* in the audiovisual area can serve the fact that the *Amending Protocol of the ECTT* was adopted after the revision of the *Directive* of 1997. This *Protocol* practically reflected the amendments in the *Directive*. The current discussions of the review of the *ECTT* are in tune with the latest revision of the *TVWF Directive*. As a matter of fact this process has started well ago – since 2001 the effectiveness of the articles of the *Convention* and the *Directive* is thoroughly analyzed. Both sets of regulations stipulate mainly that:

- Parties to the agreements should guarantee free reception on transmission on their territories of TV programs from other signatories;
- They govern the amount and kind of advertising permitted;
- They protect minors against exposure to pornography or gratuitous violence;
- They provide for a right of reply for persons whose reputations are injured by an assertion of incorrect facts;
- They seek to promote endogenous (local) production of television programs, in part by specifying that a majority should be made in Europe.

In another five years after the *TVWF Directive* was amended, the European audiovisual sector has changed dramatically. The convergence of technologies provides interweave of linear and non-linear services. The expansion of fixed broadband, digital TV and 3G networks is rapidly changing viewers' habits. The vertical structure of audio-visual programming is steadily being displaced by horizontal fragmentation of the audiences, wishing to follow their own viewing time schedule. The technological progress has imposed a strong impact on the business models of the media industry. A need for modernization and adjustment of the regulatory framework was felt in this new situation of rigorous market and technology developments.

After a large and intensive discussion more coherent measures to reinforce pan-European audiovisual policy were proposed to the Community legislator, taking into account the objective to create a pro-competitive, technologically driven and growth oriented environment for the development of the audiovisual sector. A broad consensus on the scope, European works, co- and self-regulation, independence of the national media regulators has been achieved. The first reading at the *European Parliament* of the proposed new *Audiovisual Media Service Directive* reaffirmed the basic pillars of Europe's audiovisual model, such as cultural diversity, media pluralism, and protection of minors, consumer protection, and the intolerance against incitement to racial and religious hatred. It recognized that “*Audiovisual media services are as much cultural services as they are economic services. Their growing importance for society, democracy – in particular by ensuring freedom of information, diversity of opinion and media pluralism – education and culture justifies the application of specific rules to these services.*”

Within the meaning of the *Treaty of Rome* – the EU's founding document, broadcasting is considered a service. The requirement of freedom of movement of goods and services across frontiers of Member States is basic for achieving the pan-European objectives (*Treaty*, 1957). Some thirty years later, revising the *Treaty of Rome*, the *Single European Act (SEA)* added new momentum to European integration by completing the internal market (*SEA*, 1986). And according to the *General Agreement on Trade in Services (GATS)*, since January 2000, audiovisual services sector has become the subject of multilateral trade negotiations. The sector includes motion picture and video tape production and distribution services, motion

picture projection services, radio and television services, radio and television transmission services, sound recording (GATS, 2000).

The field of the *Convention* and the *Directive* is very flexible and dynamic. That is why the work on their improvement is an ongoing process. In particular the current discussions on the review of both instruments by the participating Parties concern:

- the scope of the *Convention* and *Directive* (the broadening of the traditional television broadcasting towards the ICT audio-visual services);
- the duties of the Parties of the *Convention* and the *Directive*;
- the broadening of the jurisdiction and the scope of the regulatory practices, involving co-regulation and self-regulation;
- the freedoms of reception and retransmission, including intended and unintended transfrontier distribution;
- the developments of advertising techniques (advertising, sponsorship, tele-shopping, product placement, etc.);
- the protection of rights granted by the *Convention* and the *Directive* (such as right to information and cultural objectives, media pluralism, right of reply, protection of minors and respect for human dignity), etc.

The rapid change of the audiovisual market requires thorough refining of the existing norms in the *Convention* and the *Directive* under broad consensus. The question is whether the regulatory changes should anticipate or follow the practices.

Promotion of media pluralism and content diversity

Already for many years one of the constant objectives in achieving sustainable democratic environment on pan-European level has been the persistent promotion of media pluralism and diversity of media content. Both the *Council of Europe* and the *European Union* have been very active and productive in discussing the issue through a number of recommendations, resolutions, declarations, opinions, communications, research papers, etc. prepared to reflect the rapidly changing media sector.

One of the first pan-European documents attempting to define the concept of pluralism, is the *Commission Green paper "Pluralism and Media Concentration in the Internal Market"* COM (92) 480 of December 23, 1992. "*The variety of expressions used containing the word "pluralism" – pluralism of the media, pluralism in the media, the pluralist nature of the expression of currents of thought and opinion, pluralism of information, pluralism of the press, plurality of the media – shows that there is no common understanding of the concept. However, two common features do emerge from a legal analysis of the European Convention on Human Rights as interpreted by the European Court of Human Rights and of national laws:*

- *the concept of pluralism serves to limit the scope of the principle of freedom of expression;*
- *the purpose of such limitation is to guarantee diversity of information for the public"* (Green paper, 1992).

The phenomenon of media pluralism and content diversity has been unceasingly a central issue of the European policy making. Earlier this year both the *European Commission* and the *Council of Europe* have published a number of documents, concerning the problems in the media environment, rising from the rapid technological developments in the audiovisual area. On January 16, 2007 the *Information Society and Media DG* of the *European Commission* initiated a three-step approach on *Media pluralism: the need for transparency, freedom and diversity in Europe's media landscape*. This new program points out that media pluralism debate should concentrate not only on the grounds of media ownership but also on the transparent mechanisms, which will guarantee the access of the citizens to varied information

so that they can form opinions without being influenced by one dominant source. A key issue in this process is the functioning of the media as genuinely independent.

Presenting the three steps, the Information Society and Media Commissioner Viviane Reding underlined especially, that "*While the media face radical changes and restructuring due to new technology and global competition, maintaining media pluralism is crucial for the democratic process in the Member States and in the European Union as a whole.*" This requires a sound understanding of the economic and legal reality of today's European media landscape, which our three-step approach seeks to achieve." (EC, 2007).

Two weeks later, on January 31, the *Committee of Ministers of the Council of Europe* adopted three documents, concerning the further promotion of media pluralism and content diversity in the new digital environment:

- Declaration on protecting the role of the media in democracy in the context of media concentration;
- *Recommendation Rec (2007) 2 on media pluralism and diversity of media content*;
- *Recommendation Rec(2007) 3 on the remit of public service media in the information society*;
- *Recommendation Rec (2007) 2 to member states on media pluralism and diversity of media content* stipulates that governments of member states consider including in national law or practice:
 - Measures promoting structural pluralism of the media, such as: ownership regulation; public service media, other media contributing to pluralism and diversity; access regulation and interoperability, other support measures.
 - Measures promoting content diversity, such as: promotion of wider democratic participation and internal diversity; allocation of broadcasting licensees and must carry/offer rules; support measures; raising awareness of the role of the media.
- Media transparency.
- Scientific Research (CoE, 2007).

The challenges to television

Media pluralism is usually linked to the democratic performances of society. However, the bigger number of media outlets does not necessary means that diversity of contents has been achieved. The concept of pluralism can be defined both in terms of its function and in terms of its objective. Concerning television, media pluralism can be assessed through the number and types of channels, the number and structure of their owners, the editorial content of the broadcasts, and the access of different societal groups to the programming.

Over the last years media concentration (or media consolidation) has been considered the main threat to media pluralism. Concentration ownership structure of mass media industries usually suggests a state of monopoly/oligopoly or large-scale owners in a given media industry. Concentration of media ownership suggests also the presence of media conglomerates, such as Disney, CBS, Time Warner, News Corp, Bertelsmann AG, Viacom, and General Electric, which together own more than 90% of the media market (Concentration, 2007).

The fear of the negative consequences of media concentration is mainly connected with the availability of less diverse opinions in media and with the fewer opportunities for certain minority groups (including ethnic, religious, cultural, linguistic, and other) to reach the broad publics through media. Both of these problems are considered significant obstacles to the development of healthy, competitive media market. A major concern is also whether a consolidated media market (especially on a local level) can be accountable and dependable in serving the public interest, especially in times of crisis and in cases of emergency. The

ultimate results of such media market consolidation is viewed as poorly-informed public, restricted to reduced options of media array, which offer mainly information, supporting the media owners' interests. Thus, media deregulation may become a dangerous trend, if it facilitates an increase in concentration of media ownership, and subsequently reduces the overall quality and diversity of information communicated through major media channels. Increased concentration of media ownership may also lead to the censorship of critical debate on certain problems, to the absence of a wide range of issues of public interest and to an increased commercialization of contents.

The effects of media merge on pluralism must be carefully assessed by reference to the environment in which it occurs. The extensive research on the issue of media concentration and pluralism could not identify in quantitative terms a direct link between media concentration and content diversity. (Ward, 2006, p.1)

Besides, in some cases consolidated capital may have a positive effect on pluralism. It may ensure better competitiveness against the media conglomerates, maintain reduced costs of operation, increase diversity of content supply to an extended area, provide for more and differentiated products and services, thus better answering the demands of the publics.

Comparing the two sides of the problem, it should be noted that "approaching the issue of media pluralism solely from the perspective of media ownership concentration is unproductive". (Jakubowicz, 2006).

A prevailing trend in contemporary society is the growing number of TV channels which carry out the external (structural and market) pluralism. In this case, regulatory measures may be directed at organizing such relations between the various media companies so as to ensure a degree of autonomy between them. The combination of terrestrial broadcasts with cable and satellite TV towards the households on EU territory is expected to grow into a strongly competitive environment, allowing for program, technical and financial backup. Digital compression of the spectrum already has opened up access to the widest possible range of programs (DVB-T, DVB-C, DVB-S, DVB-H) through the offer of more commercial and public services in many countries. Broadband (IPTV, xDSL), which enhances the individual selection of the programs, is now on the agenda. That is, the television actively moves towards diversification of the services on offer. It is becoming a service itself.

In the contemporary world the media are choking with unvaried in form and content entertainment formats. The form of presentation has certainly its hefty say in the television, but if deprived of content, it becomes nondescript and unpromising. Along with this, some meaningful for the public interest programs, are neglected owing to lack of attractiveness, compared, for example, to the reality shows. Thus it becomes evident that realization of the principle of structural pluralism is tightly bound to the meaning of content in the TV programs, i.e. to the realization of meaningful internal pluralism. If we fail to find such combination of diversity and quality, we will be doomed to endless switching on from channel to channel, seeking in vain something meaningful in the ocean of flickering TV images: pluralism is meaningless in such a situation (Raycheva et al, 2003). In this case, the measures may be directed either at the internal organization of the media company whose control structure will have to represent the various currents of opinion, or at the editorial content of the broadcasts.

From the viewpoint of content, guaranteeing of political and cultural pluralism merits special attention.

Concerning political pluralism, the media often act as the main subject of political manipulation, especially before elections. The active role of television in politics relates to its impact on the various stages and sides of the information process in society. The starting point in this process is the selection, processing and distribution of information. A prime postulate in contemporary political science is that authorities rely on information resources.

The skill of sifting out meaningful from immaterial information enhances the power potential. The possibility to distribute information, in one's own interpretation at that, with channels to boot, or to hold back some of it, multiplies the power capacity. (Bauman, 1998, p. 21). Direct exercise of such power is a prerogative of the media. That is why, when powerful media fall under the control of economic or political power groups, this significantly deforms democracy.

Concerning cultural pluralism, there are two risks in this sphere: one is diluting the national cultural identity and uniqueness, the other is national encapsulation. Multiculturalism is rife with the danger of forcing in and taking up foreign models. Transnational TV formats gain ever larger territories in the poorer countries, displacing their cultural traditions. Threatened are the main public values. Thus pluralism may turn into its opposite by losing on the way entire styles, epochs, national models, and favorite works of other generations. In this sense it is important to preserve the cultural identities, the letters and the languages in the EU integration processes. The constitutional rights of minority groups (ethnic, religious, cultural, linguistic and other) to education and information on their mother tongue are also part of the cultural pluralism of the media.

Contemporary television is a convergent phenomenon, combining the intellectual product with technological potential, market mechanisms, regulatory practices and response of the audiences. Along with this, the television is both a reflection and an embodiment of the post-modern concept, with its key characteristics of fragmentation, intertextuality, simulation, plurality. Fragmentation is intrinsic to television owing to its programmed and multi-channel character. Intertextuality got a boost with the advancement of digitalization. The principle of simulation in fact reversed the situation of television mirroring society into society mirroring television. Contrary to these three characteristics, however, pluralism cannot be viewed as intrinsic to television. Pluralism is determined by the tasks set to the television and the manner it deals with these tasks.

There is, however, a problem that comes to the fore: greater opportunities for selection carry weight only if there is something to choose from. What is the use of the great number of channels if they are filled with the same programs, or with similar tastelessness? That is, the pluralism of content has been brought to nil.

Conclusion

The significance and role of television in the contemporary world has been growing tremendously with the development of new platforms for distribution of audio-visual content. The television not only continues to inform the audiences, but to shape out their views too. Moreover, it rather catalyzes than reflects the public processes, thus creating preconditions for reformatting the very society to an extent at which it begins to reflect the developments on the TV screen. This mutual interpenetration is aided by diffusion of some other kindred activities with the media world. The political elites are quick to use the media for their PR purposes. For the economic elites, the media are the main distributors of their advertisements. The needs of the public are increasingly forced out of the media. Paradoxically enough, the governments engage in regulatory protection of the public service television which is supposed to be its most vehement critic. Self-regulation has failed to become the public ombudsman and corrective of the commercial influence yet. Even enhanced interactivity could hardly pull the recipients out of their assigned role of users and consumers. The Internet environment is aiding the fragmentation of audiences, but still fails to change the prevailing vertical communication model. The moment it succeeds, this would probably bring in large functional restructure of the traditional mass-media system.

The rapid technological developments of the information and communication industries outline the need to modernize the regulatory framework and practices. The adoption of the new *Audiovisual Media Service Directive* is on its way as well as the revision of the *European Convention on Transfrontier Television*. The modernization can be viewed from several aspects:

- **In political terms**, the development of free and unhindered transmission of audiovisual services on pan-European level governed by a common legal framework is important for pursuing *EU* objectives. In view of the democratic, social and cultural significance of the media policy makers and public authorities should enforce adequate measures to ensure transparency in the media sector and prevent the conflicts of interest which pose a threat to the independence and plurality of the media.

- **In technological terms**, the turbulent progress of information and communication technologies is challenging the concept of traditional broadcasting, which is limited to the number of analogue channels. The rapid spread of cable systems, broadcast satellites, low-power TV has expanded the offer of diverse programs. Digital technologies, broadband and web casting increase the number of channels, providing the viewers with multiple choices of programs and audio-visual services. The contemporary audiovisual reality becomes more and more complex with the interweaving between linear and non-linear programming as well as between broadcasting and audiovisual service.

- **In economic terms**, the expanding tendency towards deregulation and privatization in broadcasting leads to predominance of the commercial structures. The media content becomes more and more dependent on market mechanisms. Thus, the merger control at the European, as well as national level, should be complemented, where appropriate, with specific measures to protect and promote media pluralism

- **In regulatory terms**, the tendencies to merging media, telecommunications and entertainment industries lead to changes in the legal basis of the regulatory approaches (in structure and duties of the regulatory authorities, in methods of regulating (regulation, co-regulation and self-regulation) and in audiovisual content, subjected to regulation). In this sense it is of great importance to outline the parameters of the “regulatable” content”.

- **In social terms**, the quantity of program offer leads to fragmentation, demassification of the audiences of the traditional broadcasting (one to many), thus opening ground for non-broadcasting and interactive audiovisual services. Further on, the Information Society services offer their products in a “one to one” mode. Through citizen journalism and citizen media individuals can produce and disseminate information and opinions that are marginalized by the mainstream media. The broad impact of media on general publics in real time is reduced due to the asymmetric communication offered by diverse electronic sources.

- **In professional terms**, the rapid introduction of the technological innovations is challenging the traditional formats, styles, and modes of programming. The process of media convergence as well as the interactivity tendencies raises serious questions in managing the editorial content. The significance of self-regulation and application of ethical codes of conduct become ever more important for the journalism practices. Public service broadcasters should contribute to media pluralism by providing a diverse range of quality programs. Media organizations should develop media accountability systems in order to strengthen professional values, editorial and journalistic independence and quality journalism.

The new pan-European actions of further promoting media pluralism and content diversity in the audiovisual sector are of major economic, social and cultural importance: television is still the most significant source of information and entertainment for 98% of the European households, watching television average more than 3 hours per day. However, having in mind the rapid technological developments in a highly competitive market, a major concern about the vitality of the new regulatory rules may be for how long the pillars of Europe's

audiovisual model (cultural diversity, protection of minors, consumer protection, media pluralism, and the intolerance against racial and religious hatred) will be protected.

In the 1930s, Aldous Huxley warned in his *Brave New World* that time would come when mankind may die uninformed, wallowing in a sea of information (Huxley, 1932). That time may not have come yet, but it is a fact that we find it ever more difficult to deal with the quantity and quality of information. And all this makes ever more obvious how compression of historical time dictates the new pace of the communication process with the good, the bad and the unexpected challenges of ICT.

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Households' ICT Use In An Energy Perspective

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Abstract

The starting point for this paper is the lack of linkage between two of the prominent social agendas of the time – the development of the information society and the question of how to prevent man-made climate change. The paper is intended as a contribution to integrate the two agendas by considering ICT in an energy perspective. In particular, the paper focuses on the integration of ICT in households and the energy impacts related to changing everyday practices. As this has not received much attention in previous research, the paper has an explorative character. Firstly, the paper reviews some of the previous studies on ICT and energy and the consumption perspective is introduced. Secondly, the integration of ICT in everyday practices and the dynamics behind the changes are outlined, inspired by a historical perspective. Thirdly, a figure of the relationships between changing everyday practices and the related energy impacts is presented, followed by descriptions of direct energy consumption related to household ICT, indirect energy consumption outside households, and derived impacts both within and outside households. The paper concludes with some remarks on political implications and questions for further research.

Introduction

The development of the information society has been and still is accompanied by enthusiasm and a strong sense of necessity where the challenge for political and administrative institutions at all levels is to increase the pace of the development and remove all hindrances – take care of security problems, increase the competencies of the population, supply new services, support the provision of infrastructure. The necessity springs from the drive for competitiveness and the emergence of new business opportunities in the so-called “experience economy”. At the same time, other parts of the political and administrative system are concerned with environmental issues, not the least with the prospects of global warming. Information and communication technologies (ICTs) offer both potentials for energy savings and increasing demand for energy use so there are good reasons to bring together these two agendas. In the early 1990s the first studies on the positive environmental prospects of ICT emerged (Freeman 1992), and the first steps were taken towards regulating ICT energy use. As we will return to below, the importance of ICT in relation to energy consumption has carried some interest since then, but still the two agendas tend to develop in relative isolation. As Alakeson and Wilsdon wrote in 2001: “Most European policies for the information society and for the environment have developed in separate silos, but it is fair to say that the potential environmental impact of digital technologies is increasingly acknowledged by EU policy makers” (Alakeson and Wilsdon 2003, p. 10). In spite of this increasing acknowledgement, there is still a long way to go before the two agendas of the

information society and global warming are really brought together. As a small illustrative example, it is still possible to write a nearly 200-page status on the Danish information society (Statistics Denmark and National IT and Telecom Agency 2006) without mentioning energy (or any other environmental concerns) at all.

This paper is intended as a contribution to considering ICT in an energy perspective. ICTs have many other environmental impacts than those related to energy – for instance, the use of toxic materials, brominated flame retardants, heavy metals – but these are only included in so far as they influence the energy impacts. The point of departure is taken in the integration of ICTs in households, and the energy impacts of changing household practices are discussed. Most studies of ICT and energy have concentrated on macro scenarios or the prospects seen from the production side, so households have not received much attention (there are exceptions, such as (Aebischer and Huser 2000)). On this background the paper has an explorative character, and it is based on a combination of literature studies, discussions with experts, and a visit to the “digital home” in Taastrup, Denmark. The data used in this paper mainly refer to Denmark. The main interest is to provide a basis for further in-depth studies of households and for more proactive political approaches dealing with the energy impacts of ICT, whereas there is no intention to quantify the complex relations between household ICT use and the related energy impacts, to outline scenarios for future developments or to assess whether ICT development in households is good or bad in an energy perspective. The integration of ICT in household practices is a fact, so it is less important whether the net energy impact is positive or negative than it is to find ways to avoid the negative impacts and encourage the positive.

In the following, some of the previous studies on ICT and energy are briefly mentioned and the consumption approach is related to these. Secondly, the integration of ICT in everyday practices and the dynamics behind the changes are outlined, inspired by a historical perspective. Thirdly, a figure of the relationships between everyday practices and the related energy impacts is presented, followed by descriptions of energy impacts directly related to ICT in households, indirect impacts outside households, and derived impacts both within and outside households. The paper concludes with some remarks on political implications and questions for further research.

Previous studies and the consumption perspective

Early studies on the emergence of the information society tended to emphasize the positive potentials related to ICTs. The most immediate positive impacts relate to the possibilities for increased production efficiency in most sectors: more accurate monitoring and control of processes, quality, and inventory, miniaturizing resulting in substantial reduction in the number and weight of components, and increased transportation efficiency (Freeman 1992) – and these issues are still central for more recent studies (Berkhout and Hertin 2001; Jørgensen et al. 2006). Furthermore, it is emphasized that the Internet opens up opportunities for information sharing in business and academia regarding environmental issues (Richards et al. 2001) (see also a European series of conferences under the heading Informatics for Environmental Protection), and corresponding positive effects are identified in relation to consumers and environmental NGOs (Reisch 2001).

Gradually, the enthusiasm was supplemented with more discussion on the problematic environmental impacts of ICT. Before the entry of ICTs, offices were usually considered less important when energy requirements were calculated, but from the late 1980s offices appeared as energy consuming places. Both for economic reasons and in consideration of the

environment, more attention turned towards energy savings (e.g. the U.S. EPA introduced the Energy Star labelling in 1992 for office equipment). In the late 1990s and early 2000s, a heated discussion took place in the U.S. in the wake of some provocative statements concerning the high electricity consumption of ICT equipment, titled *Dig more coal – the PCs are coming* (Huber and Mills 1999), based on (Mills 1999). The statements were repudiated by many other researchers, as can be seen from the summary of the debate at <http://enduse.lbl.gov/projects/infotech.html> where links can be found to the many contributions; short summaries can be found in (Laitner 2003) and (Cole 2003). In one of the contributions (Baer, Hassell, and Vollaard 2002), it is concluded that even large growth in deployment and use of digital technologies will only modestly increase U.S. electricity use over the next two decades, however, Huber and Mills stuck to their ideas (Huber and Mills 2003).

Other studies go beyond electricity and include both direct and indirect environmental effects of ICT use, including various categories of rebound effects, for instance (Plepys 2002; Erdmann et al. 2004). In Berkhout and Hertin's study for the OECD on the environmental impacts of ICT (Berkhout and Hertin 2001), summarized in (Berkhout and Hertin 2004), they distinguish between direct effects, indirect effects, and structural and behavioural effects of ICT. Direct effects stem from the production, use and disposal of hardware, indirect effects concern efficiency improvements in production processes and in design and operation of products and services, whereas structural and behavioural effects are a mixture of rebound effects and effects related to increased consumer information. Berkhout and Hertin argue that the direct effects are mostly negative, whereas the indirect efficiency effects are largely positive, and the structural effects (including rebound effects) are highly contested. Related categorizations are used in other studies, e.g. in the foresight study by Jørgensen et al. (2006) who, inspired by Berkhout and Hertin as well as others, consider first, second and third order relationships. First order relationships refer to the direct environmental impact from the ICT equipment and ICT infrastructure, second order relationships arise from the use of ICT in different applications and the influence on processes and products, and third order relationships concern the changing structural composition of business and product areas as well as broader social and structural changes.

In most macro studies on ICT and environment, consumers play a very minor role. This role is mostly related to the indirect, structural level where the positive potential related to behavioural change is emphasized. In particular, teleshopping and teleworking are pointed out as having a potential for energy savings related to transport (just as business travel is expected to decrease because of videoconferencing). However, in studies focusing on electricity consumers are becoming more visible. Concluding a study on energy consumption of PCs Cole writes: "While this chapter places greater emphasis on PCs in the commercial sector, the impact of PCs in the residential sector must not be overlooked. The proliferation of PCs in the home, due to expanded use of the Internet, means that the residential sector may be responsible for a much greater proportion of energy consumed by office equipment than previous estimates" (Cole 2003, p. 156-7). A direct focus on consumers appear in some Swiss and German works (Aebischer and Huser 2000; Cremer and et al. 2003; Aebischer and Varone 2001), and small sections on ICT emerge in reports on consumption and environment (European Environment Agency 2005).

Consumers have been most visible in relation to the discussion of standby electricity use. The first mentioning of standby consumption of home equipment was in the beginning of the 1990s (Sandberg 1993). Since then, the American energy efficiency conference ACEEE

(www.aceee.org) and the European conference organized by the sister organisation, ECEEE, (www.eceee.org) have had workshop sessions on standby consumption, as has the International Conference on Energy Efficiency in Domestic Appliances and Lighting, EEDAL (see <http://re.jrc.ec.europa.eu/energyefficiency/events/eedal2006.htm>). Papers have, on the one hand, focused on measurements of the size of ICT-related energy consumption in households (Roth 2006; Harrington, Jones, and Harrison 2006), and on the other hand, discussed how to agree on standards which can be useful for energy labelling and other types of product regulation (Jones 2006; Murakoshi et al. 2005). However, standby consumption has increased steadily, and one of the leading experts on standby consumption, Alan Meier, concludes that internationally the standby consumption in households represents 4-11% of the total electricity consumption (Meier 2005). There are two ways to reduce standby consumption, either to encourage producers to develop appliances using less energy or to make users turn off the appliances instead of leaving them on standby. Internationally, the former has received far most attention, and this would also be the most efficient if it was successful. In 2005, however, only Japan had compulsory programmes concerning standby, whereas both Europe and USA worked with voluntary agreements (Meier 2005). Much of the research and development presented at the ACEEE, ECEEE and EEDAL conferences is closely related to these political efforts to reduce standby consumption, and even though progress is seen, one of the problems with the regulation and standardization is that fast technology development resulting in new types of appliances and new types and levels of standby are appearing continuously (IEA 2001).

Nationally, however, there have also been campaigns targeting consumer behaviour. A Danish study focused on households' interest in and possibilities to reduce their standby consumption (Gram-Hanssen and Gudbjerg 2006). Results here indicate that some households quite easily change routines and are able to eliminate the majority of their standby consumption. Other families, however, having expectations of being online all the time, and having many of their appliances connected to each other found it much more difficult and inconvenient. Thus both the producer and the consumer approaches relating to standby consumption indicate that standby consumption is a problem continuously to be dealt with.

In this paper the intention is to go beyond the relatively narrow roles assigned to consumers in studies on ICT and energy. There is a need for paying more attention to consumers when dealing with the energy impacts of ICT, first of all because ICT is increasingly integrated in everyday life. Furthermore, a consumption perspective can highlight aspects that complement the aspects brought forth when focusing mainly on production, thus also opening up new opportunities for managing the energy impacts. In general, when a production perspective is the point of departure in environmental studies, technological changes tend to be perceived in terms of solutions, because technology can contribute to efficiency improvements. In spite of the increasing awareness of rebound effects, the perspective tends to be mostly optimistic. This differs from the consumption perspective where new technologies are only in exceptional cases introduced to improve, for instance, the energy efficiency of household activities. New technologies serve as drivers behind consumption growth and will as such contribute to increasing environmental impacts (Røpke 2001; Røpke 2003). From this perspective efficiency improvements become a modification to the main effect. The consumption perspective thus tends to bring the more problematic aspects of technological change more directly into focus – not being relegated to the position of rebound effects.

The organization of the paper is inspired by the studies mentioned above considering different levels of effects (Berkhout and Hertin 2004; Jørgensen et al. 2006). As the

perspective of this paper is more narrow than in these studies, the same categories are not directly applicable, but a related way of thinking is reflected in a three level categorization of the energy impacts related to ICT use in households. The impacts are thus grouped in

- *Direct energy consumption* (mostly electricity) related to the use of ICT equipment in household practices, both in the dwelling and on the move.
- *Indirect energy consumption* related to the provision of households' electricity consumption, the production and disposal of ICT equipment for household use, and the running of the infrastructure such as sending masts and servers. The term "indirect" is thus used here in the same way as usual in the energy literature rather than in the way used in ICT studies.
- *Derived energy impacts* relate to changes in the composition of consumption and in behavioural patterns influencing households' energy consumption as well as systemic energy consumption.

The two first categories of energy consumption tend to increase when the amount of equipment is increased, although this can be counteracted by increased efficiency of new equipment. In the third category more positive impacts can be expected to dominate, such as, for instance, those related to equipment installed to manage heating and lighting in the dwelling in an energy-saving way – however, the outcomes in this category will be highly contested. This category also covers the effects of teleshopping and teleworking for energy consumption of both households and the wider system. The term rebound effects is not used in this categorization, because the term is attached to the indirect effects of a change which is motivated by environmental concerns (rebound effects in consumption is discussed by (Hertwich 2005)). In a few cases it could be relevant here to talk about rebound effects – for instance, in the case of energy-saving heat regulation which might save money that can be used for more energy-consuming purposes – but few of the ICT requirements are motivated by environmental concerns so this will be left out.

The integration of ICT in everyday life

As a basis for dealing with the energy impacts of household ICT use, this section focuses on the ongoing process in which ICTs gain access to everyday life. The process will be seen in the perspective of the history of technology as this indicates the sweeping character of the changes.

In some respects, the integration of the computer in everyday life can be compared to the integration of the small electromotor. When the electromotor was introduced, it became integrated in a wide range of domestic appliances and tools – vacuum cleaner, mixer, refrigerator, washing machine, dishwasher, airconditioning, drilling machine, toothbrush. The electromotor could replace muscular strength and transmit energy for heating and cooling, and innovators searched for all conceivable possibilities for developing devices applying this new technology (including some of the more absurd applications, e.g. the electric tie holder). The motor became part of the thorough transformation of household work, the near disappearance of domestic servants, and the increasing participation of women in the labour force (Cowan 1983; Olesen and Thorndahl 2004). The point is not that the electromotor was driving all these changes, but it became integrated in the ongoing social processes and put to uses formed by the social dynamics. Thus Cowan emphasizes how the technology could have been used in other ways with different social outcomes, such as collective solutions to household chores, if the social and cultural dynamics had been different. The computer has a general applicability comparable to the electromotor and can be integrated in practically all everyday activities. The computer replaces or enhances brain capacity – the ability to calculate, manage, communicate, and regulate – a quality that can be used everywhere.

Presently, innovators are searching all conceivable possibilities for applying this new technology in appliances, tools, and devices that can be tempting for consumers and fit into their topical concerns and desires.

The computer is not only connected to the electricity net (directly or indirectly through batteries) as the electromotor, but can also be connected to networks of communication, including the Internet, the so-called motorway of information. The Internet introduces a new infrastructure that calls for comparisons with the introduction of electricity, telecommunication, broadcasting, and even the water supply system and the sewerage system. When these large technological systems are developed, many actors and interests are involved and contribute to the coevolution of technologies and use patterns. When such a system is stabilized, it becomes an unacknowledged basis of everyday life – one more system that we are served by and serve in our everyday life (Otnes 1988). The Internet has not yet acquired this status of unacknowledged basis of everyday life, but the new possibilities for acquiring information and entertainment and for communication are increasingly integrated in all conceivable activities, driven by both commercial and political-administrative interests and by users themselves.

The present coevolution of technologies and everyday life is, furthermore, characterized by the increasing mobility. This trend can be seen as a continuation of previous efforts to make all sorts of equipment available for activities on the move, such as the portable gramophone, the portable typewriter, the transistor radio and all sorts of equipment for the car and the camping trip. The mobile phone is probably the much successful innovation ever in this line of mobile appliances, and Levinson (Levinson 2004) argues that this follows from basic human desires: “It is a need as old as the human species – the need to talk and walk, to communicate and move, at the same time. It is a need that even defines the human species, as an organism that makes symbolically meaningful sounds with voice boxes and tongues, and goes from place to place upright, on hind legs” (p. 13). When the mobile phone is combined with wireless access to the Internet in large geographical areas, the mobile encyclopedia, the mobile library, and the mobile entertainment center are available as well. The development of wireless connections and better batteries permit that ever more activities can be carried out on the move, gradually reducing the difference between what can be done at home and on the move, respectively.

These general observations are reflected in the ongoing integration of computer, Internet, and mobile phones in numerous everyday practices. The pervasiveness of these technologies can be illustrated with examples from the different spheres of everyday life. The use of computer and Internet is increasingly integrated in:

Work and education: Telework, e-learning, ordinary school work, well equipped home offices, video conferences.

Reproductive work: Shopping, banking, public services, health monitoring, the intelligent home (regulation of heating, lighting, security systems), security, child care (entertainment, monitoring), cooking (find the recipe), do-it-yourself (exchange experiences, find information). Computer and Internet also add a new task to the list of reproductive activities, namely ICT maintenance, just as the car once added the task of car wash.

Leisure: Social communication, entertainment, games, creativity, documentation, hobbies, gambling, sex.

Civil society: Organizations, political activities.

Theories concerning the formation of practices in everyday life point out three constituent aspects of a social practice: The competences needed to carry out the practice, the material devices used for the activity, and the meaning attached to it (Shove and Pantzar 2005; Warde 2005). This theoretical framework has been used to discuss the formation and change of specific practices, but it can also be used to illustrate more general dynamics cutting across many practices. ICT is an example of generic technological change – a change of basic technologies influencing all sorts of applied technologies – which provides a supply of renewed material devices for many different practices. Simultaneously, these practices are influenced by changes in the other two constituent aspects, as technological change codevelop with changing discourses offering new meanings to various practices and with the development of training in the use of the new technologies. In Fig. 1 (next page) the three constituent aspects are illustrated in the top part of the figure, surrounding everyday practices. For all three aspects, government regulation, subsidies, campaigns, and other activities play a decisive role alongside the governance enacted by the firms and organizations involved – for instance, in the provision of safety, standards, business models, and training, as well as in influencing the discourses through reports on the need for keeping up in the competitive race, the prospects of the experience economy, and the potential for using ICT in various sectors.

In the formation of everyday practices, the ICT-related dynamics meet with other social dynamics related to dominant social concerns and trends of the time. Examples are the long-term trend towards individualization and personal independence, the discourse on busyness, stress and the balance between work and family life, and the preoccupation with body and health. In Fig. 1 these cross-cutting trends are mentioned within the box of everyday practices. In relation to each specific practice, many other, more detailed concerns will be important.

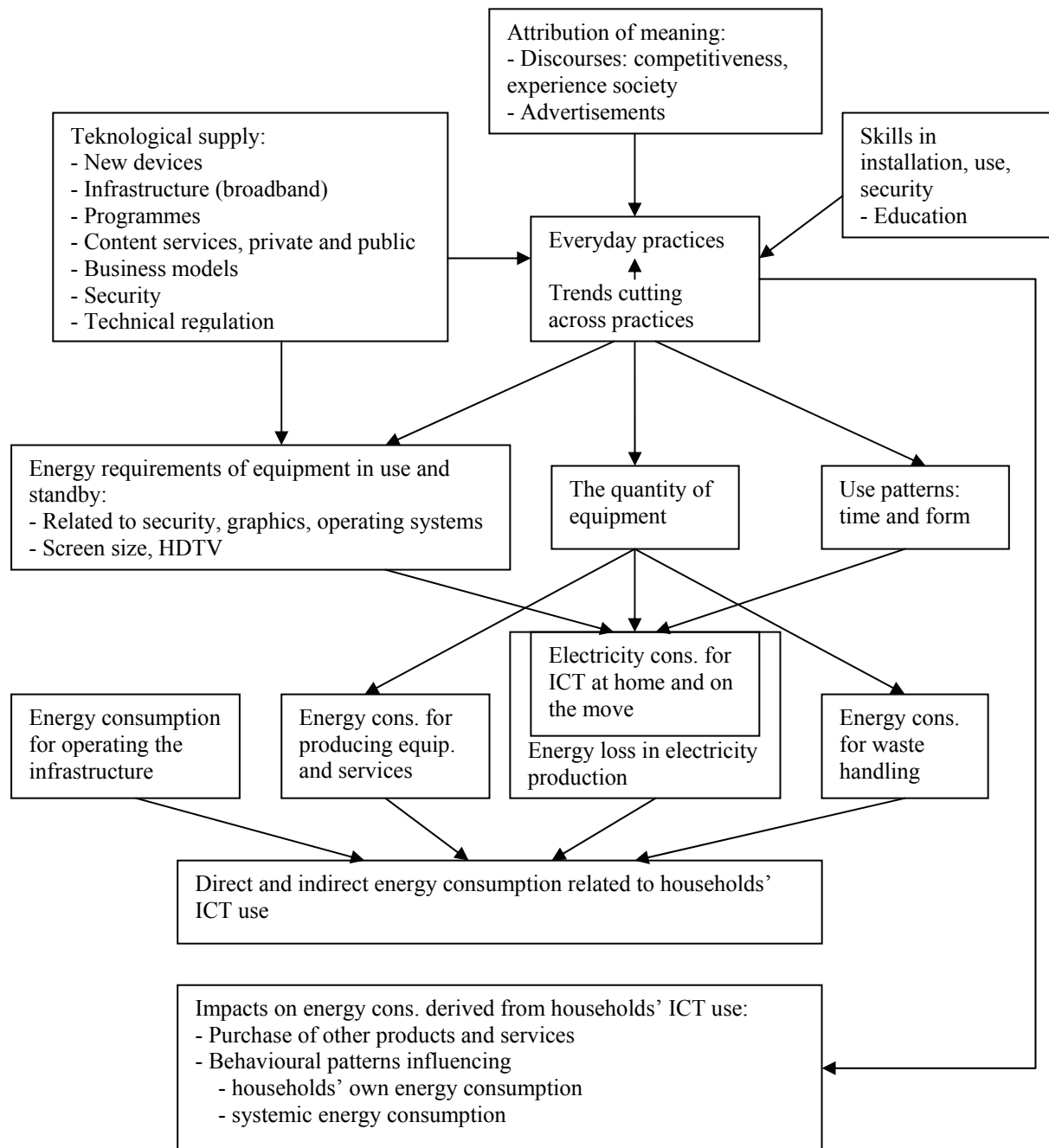
Direct energy consumption

The most immediate energy impacts of the integration of ICT in everyday practices are visible in household electricity consumption. Still this impact is not large compared to other categories of energy consumption in households, but it is increasing. Denmark has been particularly successful with regard to decoupling household energy consumption from economic growth. From 1990 to 2005 household energy consumption increased only 4.4%, but electricity consumption for light and appliances increased 18% (Energistyrelsen 2006). Most electricity is used for white goods, but the importance of media technologies, including TV, video, computers and related equipment, increases. Presently, approximately 20% of electricity consumption is used for media equipment, and about half of this is used for standby (Gram-Hanssen 2005).

As illustrated in Figure 1, energy consumption related to the use of ICT depend on the quantity of ICT equipment, the energy efficiency of this equipment, and the patterns of use, that is, the number use hours, the time on standby, and the intensity of use (the energy consumption of some appliances depends on the kind of use). In the following, some of the present trends influencing electricity consumption will be highlighted.

Presently, television and video weigh more heavily than computers, and in the near future, a particular burst of energy consumption can be expected in relation to the digitization of television and to the diffusion of HDTV, High Definition TeleVision. The increasing energy consumption is related to the need for set-top boxes that can be combined with existing TV sets or are integrated in new sets. In spite of increasing interest in keeping down energy consumption of TV sets, little interest has been directed towards set-top boxes, and many

Fig. 1. Relations between ICT-related changes of everyday practices and the ensuing impacts on energy consumption.



models are rather ineffective. As the stock of TV sets is large, nearly one set per person (Energistyrelsen 2006), and as many people have to follow suit if they want to watch television (excepted are a large group connected to cable TV who can carry on as usual), the impact can be expected to be considerable. Of course, digitization can be an opportunity to replace older energy-consuming models with newer and more energy-effective models (LCD (Liquid Crystal Display) flat screens are more efficient than the old CRT (Cathode Ray Tube) screens), however, replacements are often combined with increasing screen size, counterbalancing the efficiency improvements. The interest in so-called home cinema equipment has increased, including acquisition of plasma screens which are particularly energy-consuming. TV sets prepared for receiving HDTV are also more energy-consuming because of the higher resolution. Instead of following the trend towards increasing average efficiency exhibited by white goods, the average efficiency of TV sets has been relatively stable and even decreased a little (Energistyrelsen 2006). As mentioned, the number of TV sets is already very high, but the diffusion of flat screens might increase the number further, as these screens are easy to place everywhere, bringing TV into kitchen and bathroom and adding to the use of TV as a kind of “back cloth” for other activities.

Digitization of television does not directly seem to be part of any profound changes in the practice of watching television. The quality of the picture improves, and it is possible to turn on subtitles in various languages. When digitization is combined with the use of media centres / harddisk recorders, the opportunities for flexibility are increased as programmes can be shifted in time more easily than with the use of video and DVD. Visions regarding interactive television are discussed (Jensen & Toscan 1999), but it still remains to be seen whether practices change more profoundly.

While television is bound to a particular, although very time-consuming, practice computers and Internet are integrated in a wide variety of practices. The increasing energy consumption related to computer and Internet springs from the integration in an increasing number of practices and the ensuing increase in time use and amounts of equipment. When time use at the computer increases, household members increasingly demand their own computer so they do not have to wait for their turn. The demand for individual independence that is well-known from the acquisition of TV sets now makes itself felt for computers – each person his or her computer seems obvious for the younger generations. A less developed trend – which might become more important in the future – is the emergence of activity or room specific computers, for instance, specially equipped computers for use in the kitchen, the bathroom or in the garage where conditions may be tough.

Due to rapid technological change and ever more advanced applications, there is not only a demand for more computers, but also for ever more powerful computers and other ICT equipment. Demand thus increases for

- higher quality, such as larger screens with better resolution
- more processing power needed for, for instance, running the latest versions of operating and security systems and for the advanced graphics of games
- more data storage capacity, needed for the increasing amount of photos, videos, sound files, mails
- larger bandwidth, needed for video-streaming and for upstream P2P (peer to peer) file-sharing of videos and music.

These changes constitute a strong force counterbalancing improvements of energy efficiency.

Seen over a long period, various factors have influenced the energy efficiency of computers (based on (Cole 2003)). To increase the processing power of computers without increasing the size, heat reduction was necessary and this stimulated efficiency improvements. With the introduction of laptop computers energy-saving was encouraged because of the desire to increase battery life, and the advances for laptops were later brought into desktop computers. For instance, this was the case for built-in power management which was brought from laptops to desktop computers in the early 1990s. The U.S. conservation programme, Energy Star, strongly encouraged further improvements so from the mid-1990s standby consumption decreased drastically, and impressive savings were achieved in business offices in the U.S. However, the power levels in operation did not change much, because the efficiency improvements codeveloped with more powerful microprocessors, more memory, and more disk storage. The monitor part of the computer became more energy-intensive in the 1990s because of the almost universal shift to colour screens and larger screens with higher resolution. However, over a more extended period of time the shift from CRTs to LCDs saves energy.

As modern computers are very diverse due to consumer-specified features, the power requirements vary so much that it can be difficult to assess the general trend (Cole 2003, p. 138). Danish data indicates that the average new desktop computer is not requiring less energy in operation than computers a few generations older (T. Fjordbak Larsen, pers. comm.). However, an increasing number of new computers are laptops, and they are more energy-effective than desktop computers. In 2006, for the first time the number of laptops sold in Denmark exceeded the number of desktop computers. This can be an energy-saving trend if the laptops replace the desktop computers, but it is difficult to assess to which extent the laptops are additions rather than replacements. Desktop computers are still cheaper in terms of processing power per dollar, so a person interested in playing games or carrying out other demanding graphical activities will often prefer a desktop. Furthermore, it is easier to extend a desktop computer with supplementary graphics cards or other peripherals.

The power management functions offer good opportunities for energy-savings, but they have to be activated. This is not always done, either because of lack of knowledge or because of technical difficulties, for instance, related to network connections and the coupling to other equipment.

The question of complementarity versus substitution in the case of laptops and desktops can be raised as a more general question. In many cases, ICT equipment incorporate a variety of functions and can, in principle, replace other, more specialized appliances. An example is the camera phone which can render the camera superfluous. However, the camera in the mobile cannot provide the same quality and capacity as the dedicated camera so the camera phone may become part of a diversification process rather than part of a rationalization of the number of appliances. Another example is the combined printer-scanner-copy machine which can reduce the number of appliances attached to the computer. However, it is expensive to run a scanner because of the need for colour cartridges, so it can be cheaper to invest in a supplementary laserprinter for printing texts.

The trend towards diversification of equipment seems to be strong, as it is reflected in the wide variety of available devices advertised in magazines. Not the least for mobile devices is the supply widening as more functions become available on the move. Rapid technological change implies that multiple generations of equipment co-exist, for instance, taperecorders – CD players – MP3 players, and video – DVD – harddisk recorders. Consumers thus tend to

have an increasing number of small and/or supplementary devices, often in various ways related to the core products – the computer and the TV set. The direct energy consumption of each of these devices in the use phase is usually not large (except for standby consumption that can be high for some products), but the sum of the small contributions may be significant. Adding to this is the phenomenon that less attention is focused on the energy consumption of the peripheral devices than on the energy-efficiency of the computer and the TV set. One reason may be the quick renewal rate which does not allow producers to pay much attention to optimizing energy-efficiency, and another reason may be the lack of regulatory attention, partly due to the difficulties related to regulating products that are changing so quickly.

A particular trend adding to the ICT-related energy consumption emerges from the phenomenon of multi-tasking. Especially, young people are able to manage computer, television, music centre, mobile phone, and the electric guitar – all at the same time. A Danish study thus demonstrates the high electricity consumption of teenagers (Gram-Hanssen, Kofod, and Nærvig Petersen 2004). Older generations may be less able to multi-task, but they are able to install systems that use electricity without anybody being present, such as surveillance cameras and other security systems. One of the visions related to the “intelligent home” is the possibility of communicating with the security systems at a distance, for instance, opening the door for the postman bringing a parcel or the plumber coming to repair an installation in the house.

Finally, it is worth mentioning that the search for new ways of using ICT has resulted in more functions using energy in the use phase – functions which were previously carried out without energy consumption in the use phase. Examples are the electronic diary and shopping list, maps for navigation, photo frames showing digital pictures, and surveillance.

Summing up, the increasing direct energy consumption related to ICT equipment has many sources. The effect of increasing quantities of equipment and of more time spent on activities using ICT is difficult to counterbalance with efficiency improvements, in particular, because the equipment in itself becomes more powerful, and because in some cases, the attention to energy-efficiency is limited.

Indirect energy consumption

Presently, we have few available data for elucidating the indirect energy consumption related to household use of ICT, so this section will only include some preliminary reflections. The indirect energy consumption arise from the production of electricity and from the other phases in the life cycle of the ICT equipment, apart from the use phase. Furthermore, the importance of the supporting infrastructure is considered.

The first component of the indirect energy consumption relates to the provision of the electricity used for operating the household equipment. This component differs between countries in accordance with the efficiency achieved in electricity production. Due to a high degree of combined power and heat supply, this efficiency is relatively high in Denmark. This component of the indirect energy consumption is thus only about the same size as the direct electricity consumption.

The second component relates to the energy used for the production of the ICT equipment. Kuehr, Velasquez, and Williams provide data for the environmental impacts related to the

production of computers, and they emphasize that a significant share of these impacts are incurred in the production phase: “For a desktop computer used at home, for example, the energy needed to produce the machine is four times more than that needed to power it during the use phase. The energy consumed to produce a refrigerator is only about one-eighth the electricity used to run it” (Kuehr, Velasquez, and Williams 2003, p. 4). For mobile phones the economic life is very short and this makes the relative importance of the energy consumption in the production phase even larger (Legarth, Willum, and Gregersen 2002). In other words, the rapid rate of renewal for ICT equipment implies that energy use for production is a very important category.

The third component relates to waste handling. The high-tech parts of computers and other electronic equipment are difficult to recycle, while the bulk materials like steel and aluminium are easier to handle. Klatt (Klatt 2003) outlines the many technical difficulties that recycling of computers meet with and explains why it is quite costly, however, he gives no information on the energy costs of the process.

Finally, the fourth component relates to the operation of the ICT-infrastructure (a brief discussion on this can be found in (Hille, Aall, and Klepp 2007)). A recent report from IDC illustrates the enormous growth of digital information and the need for storage capacity not only at user level, but also for service providers such as Google (Gantz and et al. 2007). Some service providers run large parks of servers, so services that appear to be virtual – immaterial – from a user perspective can be based on quite extensive material investments. The virtual world of “Second life” thus has a material basis in the servers of Linden Lab.

Derived energy impacts

While both direct and indirect energy consumption tend to increase when the number of appliances and the time spent using them are increased, the derived energy impacts are more likely to be positive. Most obviously, ICT can be used directly for energy savings. Thus ICT can be used for managing heating and lighting in the dwelling (lowering of the temperature at night, sensors turning off the light when nobody is in the room), and ICT can also make it easier for households to monitor their energy consumption and thus encourage savings. The Danish Electricity Saving Trust estimates a potential for electricity savings from 10 to 30% in households by using intelligent building systems to control the electric equipment. For instance, in summer cottages, heated by electricity and only used occasionally, there is a large potential for reducing the consumption by using such systems. However, the existing systems are too expensive today, due to a lack of competition, and also the standards are closed, meaning that they cannot communicate with the electronic equipment of existing systems (Ingeniøren newsletter, 21.04.2006).

Also, the Internet can be used for making available relevant information on energy savings, as can be seen, for instance, at the homepage of The Danish Electricity Saving Trust <http://www.elsparefonden.org/> and the recently initiated public campaign encouraging people to save 1 ton of CO₂. While these impacts are positive in an energy perspective, it should not be overlooked that the Internet, in an analogous way, can encourage energy-intensive consumption – for instance, by making available new options for booking cheap flights and finding exotic travel destinations (Reisch 2001).

While it is relatively simple to see that ICT can be used for energy-saving purposes, it is far more complex to consider what happens to the various practices in which the use of ICT

becomes integrated. In some cases the use of ICT is just an “add on” where more equipment is added to well-known activities that are not much changed. An example can be the use of a “running computer” for monitoring one’s training efforts; such an addition does not change the practice of running in ways which have derived impacts on energy consumption. The same goes for quality improvements, such as larger screens, HDTV, and better graphics in game consoles.

In other cases the practices are changed more profoundly by the integration of ICT. Environmental improvements, including energy-savings, have been expected from such changes, in particular, in relation to teleshopping, teleworking, and the replacement of material products such as newspapers and CDs by Internet-based services. Jørgensen et al. (2006) summarize a number of studies on telework and transport. Whereas some of the early studies were very optimistic with regard to the potential for energy savings, more recent studies emphasize that a substantial part of the transport savings are counterbalanced by increased transport for other purposes and increased transport by other family members. In general, the results regarding structural impacts are highly sensitive to system boundaries and dependent on behavioural assumptions. Studies are often inconclusive because it is difficult to know, for instance, whether people will continue to go shopping although they buy some things via the Internet, and whether they will move further away from their workplace to take advantage of lower property prices when they work at home part of the week.

Supplementary to the discussion on derived impacts in relation to individual practices, it is possible to raise the issue from a more general perspective: If consumers tie their money and their time to the acquirement and use of ICT, then less money and time are free for other purposes – and the question is whether these other purposes are more or less energy-intensive per monetary unit and/or per unit of time. It may seem surprising that the question is raised in terms of both money and time, as one of the two perspectives could appear to be sufficient, in particular, if an economic maximization model is applied (Linder 1970). However, in practice both time and money constitute limitations on consumption, and institutional constraints imply that the two factors cannot be reduced to one another. To start with the monetary perspective, the acquirement of ICT equipment and services takes up an increasing part of consumers’ income. In general, competition on hardware keeps prices down and energy-intensities high. In some cases, service providers have succeeded in keeping high prices due to monopolistic or oligopolistic market conditions which implies a relatively low energy-intensity per monetary unit (examples are charges for phoning, Internet access, and packages of television programmes). However, public regulation is quite active with regard to breaking the monopolistic tendencies, not only because of the general wish to promote competition, but also because of the particular interest in developing the information society. A recent project thus demonstrates that the energy intensity of ICT-based leisure activities is relatively high (Hille, Aall, and Klepp 2007, p. 166-67).

From the perspective of time, it is worth considering whether the integration of ICT tends to take up time that could have been used for other purposes or whether, on the contrary, time is freed for other purposes. If, for instance, reproductive activities such as paying the bills, shopping, and contacting the taxing authorities, can be carried out in a shorter time by using the Internet, then time is freed for either working more (and earning more money) or having more leisure time (where money can be spent). Also activities usually considered to be leisure, such as planning holiday travelling, can be done more effectively, thus freeing time. Multi-tasking and accomplishing tasks on the move can add to the productivity increase. On

the other hand, the Internet is known to be time-consuming as one can become absorbed in surfing and sidetracks, reducing the time for other activities and related consumption.

It is difficult to conclude anything regarding the consequences of the changing composition of time use and consumption in the wake of ICT integration in various practices. But it can be argued with more certainty that the supply of ever changing ICT and the integration of ICT in a wide variety of products and practices serve as part of the motor driving consumption growth. It is difficult to imagine the achievement of any kind of satiety in this dynamic setting.

Concluding remarks

As emphasized in the introduction, the intention of this paper is not to assess whether the integration of ICT in household practices is good or bad in an energy perspective. Anyway, the issue is so complex that even very elaborate studies could hardly lead to any decisive conclusions. It is more important to find ways to avoid the negative energy impacts of ICT development and to encourage the positive impacts. The issues dealt with in this paper suggest various ways in which the net result can be improved:

- The indirect energy consumption, in particular, related to the production of ICT equipment carries great weight. Therefore, “The simplest and most effective way to reduce environmental burden may be to ensure that users need fewer new PCs in the first place”, as Kuehr, Velasquez and Williams argue (p. 14). In chapters 8, 10 and 13 in their anthology it is discussed how the lifespan of computers can be extended through more effective used-computer markets, smooth transfer of software licenses to secondary users, and easier ways to upgrade computers. The issue of lifespan extension is highly relevant also for other ICT equipment, not the least for mobile phones.
- Power management functions are important for electricity consumption in the use phase, and it is still highly relevant to focus on the reduction of standby consumption, both by technical means and through changed patterns of behaviour.
- Digitization of television should be complemented with intense campaigns for the choice of energy-efficient replacements.
- The focus on the energy use of the core products, the computer and the television, should be broadened to include also the wider variety of ICT equipment.
- It is relevant to keep a critical eye on ICT-uses. In spite of the enthusiasm for the information society, maybe not all gadgets deserve a place in everyday life.
- Economic considerations have not been the focus of this paper, but it should be mentioned that the net energy impact of ICT use, obviously, is influenced by the price of energy. There is a potential for using ICT for energy savings, and the realization of this potential depend, at least partly, on energy prices. The price of energy for transport is also decisive with regard to the derived impacts, for instance, whether people decide to move further away from their workplace when they get the chance to telework part of the week. In short, price incentives, as well as other incentives not directly related to the technology, influence the net energy impact of ICT use.

The above suggestions relate to direct and indirect energy consumption, whereas it is much more difficult to consider how positive energy impacts can be encouraged and negative impacts prevented when focus is turned to the derived impacts. To improve the basis for elaborating suggestions for a proactive approach to ICT-related energy consumption, further

in-depth studies of household ICT use could be useful. Such studies could deal with questions such as:

- In which practices are ICT becoming integrated? For which household members?
- In which cases does the ICT integration serve as an add-on to previous ways of carrying out the activities, and in which cases do the activities change more profoundly?
- Does the use of ICT save time, for instance, in relation to shopping, banking transactions, and enquiries to public authorities?
- Does the use of ICT save transport in relation to the same activities?
- What does social communication via ICT imply for the wish to meet?
- Is ICT applied with the purpose of saving energy?
- How often are various appliances replaced?
- Do several generations of appliances co-exist?
- Which functions are served by diversified equipment?
- Which functions are merged in rationalized equipment?
- What do households do with equipment they want to discard?

Hopefully, such studies on households' ICT use in an energy perspective can encourage that the agendas related to the information society and to climate change, respectively, can increasingly be brought together.

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New Media and Older Users: Not Just a Matter of Age, Stupid!

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Abstract

This paper discusses how older (non) users of the internet are represented in Europe's Information Society policy discourses, taking as a point of departure the fundamental divergence in representations of older age and new technologies. Social science critique of technology-centric perspectives in policy making has questioned assumptions that new ICTs are inherently progressive and produce on the whole positive outcomes with regard to quality of life, market and civic participation. What has not received critical research attention is the study of people. Disadvantaged social groups who are heavy users of welfare services are customarily defined through disabling categories, such as 'older and disabled people'. Older people's relationship with new ICTs is most commonly oversimplified, framed in terms of a generation gap. New media technologies are coded as the domain of younger generations. Older people are associated with notions of technophobia, passivity and decay. They are commonly constructed as non-engaged, unable to develop new media literacies and take up new media and services and, at the same time, considered major beneficiaries of online access to services. These increasingly prevalent definitions of older adults as a homogenous, disadvantaged group of (non)users take substantive positions about the nature of our societies and of social relationships, and bring these into the development of public policy. The tendency to take age as a key independent variable implies older people's lack of engagement with new ICTs is a temporary inconvenience, suggesting a change in the situation of older cohorts in the near future. Europe's information society policies bear a risk of failing to establish whether current levels of differential access to the internet represent a long-term challenge. This way of framing policy debates shows little evidence of an anthropocentric perspective that considers the wishes, needs, capabilities of real people. The paper suggests that ICT users are better understood as relational entities, and concludes by suggesting areas for policy intervention into lived experiences of age and media use.

Introduction

Communication and information access are increasingly mediated by digital technologies, to the point where those unable to use these technologies are at risk of being disadvantaged in a range of areas, including e-government information, ICT-enabled public services, and the more familiar public electronic communications. Expressing concern about inequities in the ability of individuals to partake on opportunities that can be realised in internet access, the European Commission's Information Society and Media directorate is currently deliberating about the levels of media literacy in Europe's population (EC, 2006). Media literacy is defined by the UK Office of Communications (Ofcom) in terms of takeup, understanding and usage of a range of electronic ICTs. Ofcom's definition, currently debated by EC High Level expert group is the ability of users to 'to access, understand and create communications in a

variety of contexts' (Ofcom, 2006a:4). Defined this way, media literacy is a condition for participation in the marketplace and the public sphere, 'starting to match the importance of other forms of literacy to work and leisure, and to the functioning of democracy' (DCMS, 2006:4). Media literacy is 'as central to active and full citizenship as literacy was at the beginning of 19th century' (EC, 2006). Without such skills, 'people's ability to participate effectively in the workplace and society may be greatly diminished' (Ofcom, 2006a:3)

Although internet use grows steadily internet takeup remains lowest between older people. According to Ofcom's audit of media literacy in the UK population, age continues to feature 'the single most significant defining factor in levels of media literacy' (Ofcom, 2006b:11). In 2004 31 % of UK residents aged between 65 and 74 and 20 % of those aged 75 or more had accessed the internet at least once, against 60 % of national population (OxIS, 2005:51-52). According to the 2006 report of the UK Office of National Statistics, there remains a large divide between the young and the old, with 83 % of the 16 to 24 age group accessing the internet compared with 15 per cent of the 65+ age group, and with 10 % of the 16 to 24 age group never having used the internet, compared with 82 % of the 65+ age group (ONS, 2006:4) Numbers fall dramatically across the EU where according to the *Eurostat* survey just over 10 % of Europeans aged 65 or over had accessed the internet in 2005 against 68% of individuals aged 18-24¹ (EU&EFTA, 2006).

Older people in Europe's Information Society policy discourses

Age then is related to whether people use the internet. Attitudes towards the internet appear to be strongly associated with age. And so is the way we make sense of the relationship between people's age and their media literacies. Our understandings of how people relate with new ICTs are defined by the sense we make of their age. Our Information Society is an ageing society, and yet advanced age is customarily associated with peril, calling policy attention through reminders of its limitations (cf. Riggs, 2004).

In Information Society (IS) policy discourses the relationship of older people with new ICTs is a double problem (Sourbati, forthcoming). Older people, especially those aged 75 or over are 'heavy users' of public services. Use of new ICTs is supposed to benefit isolated, home centred older people who use welfare services and reduce the cost of public service provision. Benefits accruing from internet access include enhanced opportunities to reach out services, convenient access to health care information and opportunities for interpersonal communication and life long learning. In that way new interactive ICTs support 'active ageing' and independent living. In the context its e-Government Action Plans, which set a national programme of action for electronic delivery of government information and services, increase of internet access takeup and boost of e-commerce (Cabinet Office 2000; 2002), the UK government has made explicit mention to the use of ICT in its policy making documents about the care of older people (Curry et al. 2002). First, to use 'assistive technologies' to make care provision more efficient and less intrusive and second, to make information about the range of care services available more accessible to older customers. However, as older people do not use new online ICTs they cannot benefit from e-public service provision. In short, older people are constructed as a category of heavy users of public services who are at risk of 'digital exclusion', along other disadvantaged groups.

¹ In 2005 57% of individuals living in the EU did not regularly use the internet; only 24% of persons with low education used the Internet, against 73% of those with high education; only 32% of unemployed persons used the Internet against 54% of employed persons. There are, of course, sharp distinctions across the EU with pensioners living in Nordic countries more likely to use the internet.

Policy circles in Europe express a growing sense of concern that e-government services haven't reached 'the elderly and those with disabilities' who are at risk of social exclusion along with people in low income (Cabinet Office, 2002). Halving the gap in internet usage by 2010 for groups at risk of exclusion, notably older people, people with disabilities, and unemployed persons is set as a key target for policy action by the 2006 Riga Declaration on eInclusion: *'In line with i2010, eInclusion policy addresses issues in the fields of active ageing, geographical digital divide, accessibility, digital literacy and competence'* (EU & EFTA, 2006:2)

Almost eight years after the launch of *eEurope* (EC, 2000) and Member State e-government action plans policy making efforts are not attuned to the need for inclusive practices and models that promote access to online connectivity by addressing the lived circumstances of different cohorts of 'older and disabled people'. In the UK, a Member State with relatively high internet penetration rates, there is no evidence of sustained policy commitment to support the development of new media literacies for older citizens and carers. Public subsidies of home internet access are not evident either. Government sponsored training to encourage older people to learn using networked computers has been available as short, half hour sessions, dubbed 'Silver Surfer' events, where library staff or community volunteers show older customers how to use the online catalogue and email. Silver Surfer events are marketed as opportunities for older people who are unfamiliar with networked computers to join 'tester sessions' to experience – if not learn – using online ICTs. Silver Surfer events have been run as part of the UK Online programme that established a network of 6,000 community internet access points in museums, public libraries and other community learning centres between 2002 and 2004 (Cabinet Office, 2002). Following the completion of the UK Online, Silver Surfer initiatives are today run mainly by the charitable and voluntary sector supported by corporate sponsorship.

Over the past couple of years Silver Surfer news feature regularly in Ofcom's Media Literacy Bulletins. For example, Issue 7 (September 2006) hosted an article on the UK '*Silver Surfer Week*' organised by the *Charity Age Concern* and supported by BT, Microsoft UK, and Intel as well as AOL, Ofcom and the National Institute of Adult Continuing Education, to 'promote adult media literacy'. According to the article, during the week-long events 17,000 older people attended computer tester sessions run at community centres, libraries, UK Online centres, local Age Concern offices, sheltered housing accommodations, village halls and commercial training companies. Issue 9 (February 2007) includes a short article entitled *Silver surfers learn web skills*: 'A technology school and a housing group based in Kent founded a project to get more than 450 'silver surfers' online. ... A Church of England school with a specialism in technology, is supporting this initiative by providing a specialist teacher who is working with residents from sheltered housing schemes to find out how technology can enhance their lives.'

The discursive portrayal of Silver Surfers is patronising and effectively reproduces stereotypical representations of older people. First entrenched as a stereotype in the end of the 1990s in advertisements targeting older American consumers of ICT products (Riggs, 2004:157-8) Silver Surfers became the metaphor of choice in Europe's e-government publicity and in commercial marketing. The 'Silver Surfer' category refers to confident and competent older consumers of new ICTs. As Selwyn et al comment (2003:262) Silver Surfer discourses 'reinforce the notion that older adults stand to benefit from ICT in various ways, and that the ability to make use of new technology is a ready means though which to "bridge

the generation gap". The concept of Silver Surfer does not challenge ageist attitudes manifested in the growing trend for newer generations of older people to be seen to act as consumers in the growing market for 'eternal youths' with regard to physical appearance and tastes². Here age as subjectivity is calling attention to itself as something that can be reversed to 'youth' through consumption. The use of ICTs is seen as a ready means for older people to regress into youth by 'reconnect[ing] or improv[ing] their connection with the outside world' (White et al. 1999:362 in Selwyn et al, 2003: 563) – the world of the young and able, the confident and the included.

Technology-centric, individualistic and polarised notions of media access

These portrayals of older people are underlain by technology-centred claims, individualistic and polarised conceptions of ICT 'users' and 'non users' and binary conceptions of ICT access and use.

Europe's IS policy goals have been media-centric. e-Government and communications policy plans for the digital switchover have placed their emphasis on the formal, technical characteristics of online ICTs. Policy proclamations have stressed the potential of new ICTs to promote inclusion, improve public services and quality of life (EC, 2005: 9). UK's digital strategy is for 'public service delivery transformed by modern technology' (Cabinet Office 2005a: 2-3). At the same time, Europe is facing a reality of low levels of access to e-government services by target customer groups³, and a minimal impact of community training programmes in encouraging 'disadvantaged groups' to access the internet: *'There is still evidence of a digital divide with some groups largely excluded from benefiting from access to the Internet. ... Some individuals may not have the confidence or skills to use computers, even though they may actually want to get online. Others do not see the relevance of the Internet to their needs. They do not see how ICT and broadband particularly can transform their lives.'* (Cabinet Office, 2005b: 7-8). Policy thinking is subsequently taking a 'user-centric' view, showing concern with the characteristics of individuals who do not use new ICTs. UK government is currently prioritising a 'better understanding of customer needs and behaviours' especially 'the needs of key groups – such as older people' (Cabinet office, 2005a: 7-8).

Older people's engagement with new ICTs is commonly understood in terms of age-related cognitive, mental and physical decline. Barrier analyses typically mention how a decline in vision and in physical dexterity stand on the way of older people's use of computer technologies designed for younger, able-bodied users and how their learning to use new ICTs is further impeded by declines in perceptual and cognitive abilities. Research into the role of non users has additionally looked at attitudinal factors. A UK survey by Ofcom's Consumer Panel (Ofcom Consumer Panel. 2006a) identified lack of confidence in learning to use ICTs, a perceived lack of interest and a perception that new ICTs are not needed as factors deterring older people from developing new media literacies. The survey reinforced a familiar conclusion that 'age remains one of the most significant factors affecting how people engage, or don't engage, with communications markets' (Ofcom Consumer panel, 2006a: Foreword, p. 1). This was particularly noticeable in the take-up of the internet where 56% of older adults 'voluntarily excluded themselves' compared to the national average of 22% (Ofcom Consumer Panel 2006a:37).

² For a review of cultural attitudes to ageing and consumption see Harkin and Huber (2004:30-37).

³ In 2005 only 15% of the population in the UK had used any e-government service (OxIS, 2005)

Within this kind of individual-centric perspectives, a growing perception of new media savvy older people has come to suggest, as Riggs notes (2004:82), that older people who haven't joined the information-rich "haves" of society 'have failed to do so out of choice, or stodginess, or they just haven't been tapped as a market segment'. For instance, Ofcom's Consumer Panel survey concluded: 'older people aged 65 and over are more likely to be voluntarily excluded; so not interested in acquiring, with no perceived need for the technologies.' (Ofcom Consumer Panel, *ibid.*). In all, IS policy discourses commonly suggest older people miss out opportunities presented in digital, online ICTs being inhibited from learning to use new media mainly because of their personal deficiencies or individual circumstances experienced as a result of their chronological age. However, as it will be shown in the following section qualitative studies of engagement with new, digital media reveals older people's attitudes are more complex than anticipated or hypothesised in policy research.

Static and binary notions of media access and (the) use(r)

Prevailing conceptualisations of older people's relationship with new media draw on static and dichotomous concepts of access, making a distinction between individuals who have access to ICTs and those who do not. IS discourses take ICT access as a binary good. This is the dichotomous view of the 'digital divide' super metaphor, which differentiates between those who have access to internet connectivity and use it to realise opportunities and those who do not. Binary and static understandings of new media access have been critiqued in social science research as flawed and partial (for a discussion see Selwyn, 2004). Internet access is not a matter of one-off connection to a networked computer. It is a matter of degrees and qualitative differences. Access rests on a dynamic and social process, not a one-off act of provision. Engagement with new, interactive media is also a function of access to knowledge and learning. The realisation of benefits derived from internet use rests on a range of analytic competencies, social practices and material circumstances (Livingstone, 2004a). It entails the continuous development of skills and competencies; at its simplest skills in using computers and browsers. Increased use of the internet leads to greater proficiency and confidence in the ability to do a variety of things with the technology and its capabilities: 'Once initial access is established, developing literacy leads users to alter significantly and continually the conditions of access (updating, upgrading and extending hardware and software applications).' (Livingstone, 2003a:1). Raising concerns about the effectiveness of internet use researchers have proposed the term 'digital inequality' to refer to differential ability of users to realise benefits from their access to online ICTs (Di Maggio and Hargittai, 2001, Kvansy, 2006). A way of understanding digital inequality is to place internet access 'into the system of social relations that define and sustain its cultural meanings and intended uses' (Kvansy, 2006:163, citing Bourdieu, 1980). The social relations and material structures that define 'our particular needs and capabilities to do something with the resources we believe are available online.' (Couldry, 2003:11).

The existence of a 'digital divide' between the old and young people, most commonly documented on the basis of internet takeup rates, draws on binary conceptualisations of media access. A notion of access that 'is not sufficiently nuanced to acknowledge differences in experience along axes such as education, social class or disability.' (Riggs, 2004:228-9). Ageist tendencies can be seen as a deeper substratum of dichotomies that position older and younger generations as polarised from each other and at times disengaged by the community as a whole (cf. Age Concern, 2007). The young are labelled 'internet experts'. The old are labelled 'have nots' and 'can nots'. The blanket labelling of young people as 'internet experts' simply reproduces the popular perception of engagement with new ICTs in terms of a generation gap. The confluence of technology-centric, individual-centric and dichotomous

understandings of media access has generated popular, generalising and disempowering conceptualisations of older (non) users. Older people, supposedly major beneficiaries of Information Society initiatives in e-public service, e-government, e-learning, e-health and digital entertainment media, are positioned as uninterested and incapable to develop new media literacies. They are perceived to show a deficit in their new media literacies and consequently positioned as deficient.

Who are the older people in Europe's IS and how they engage with new media?

This paper suggests that policy questions of media literacy and the position of older people are better understood if we move our thinking away from ageist generalisations, get rid of static and dualistic notions of ICT access and reject individualistic concepts of media use. The public policy question regarding access to the internet and new media-enabled public services is how interactive engagement is encouraged and facilitated, how competencies are developed, how material and social infrastructures are made available, how new media capabilities are learned.

Although research into older people and new ICTs is scant the available studies indicate that in Western economies with high internet takeup rates today's older internet users are more likely to come from the relatively affluent, educated, white middle classes. In the UK internet access among older adults is currently stratified by socioeconomic status and educational background (Selwyn et al. 2003). In the USA 'class and race or ethnicity help to predict on which side of the Digital Divide elders are positioned, along with income and educational levels' (Riggs, 2004:226). Qualitative studies have indicated different generations of older people encounter new, online ICTs in complex and varied ways (Richardson et al. 2005; Sourbati, forthcoming) and practices of media use are embedded and grounded in existing relations of social interaction, meaning, and material structures (Riggs, 2004). This was recently highlighted in a qualitative study by Ofcom's Consumer Panel (2006b). Unlike the overall conclusion of the Media Literacy Audit of their parent regulator, the Office of Communications (Ofcom, 2006a; 2006b) and the first Consumer Panel survey (2006a), this study reported that age and health did not appear as key determinants of whether or not older people were connected to the internet but skills and ability, social and environmental factors and learned ways of doing things did. As put by a 65 year old respondent from Belfast 'young people are taught the skills from a young age, we've lived a long time without having to think like this' (Ofcom Consumer Panel, 2006b:10) The study found 'digitally engaged' older pensioners had developed new media literacies primarily as a result of their experience in the workplace (ibid.3) and exposure to and engagement with media technologies led to further development of media literacies (ibid. 1).

Critical research has questioned policy understandings of media literacy as a feature of the user. The ability to access, use and create communications cannot be taken as a property of the generalised individual. Media literacy is more realistically thought of as an emergent property, conceptualised in terms of the ongoing nature, as a relation between 'the user' and the 'media technology' (Livingstone, 2003b). We develop media literacies in and through our interaction and interface with media. Media literacy cannot be conceived solely as a feature of the user: it 'is not reducible to a feature or skill of the user' (Livingstone, 2003b:2) but must also be seen as 'a co-production of the interactive engagement between technology and user' (Livingstone 2004b: 12). Media literacy is better conceptualised as a relation between the ICT and its user whereby 'the user and the functionality of the [technology] mutually construct each other' (Tuomi, 2005:22)

Penetrating the interface: Beyond individuals and technologies

A more appropriate perspective in the study of policy questions can be found in Tuomi's suggestion (2005) for a reconstruction of our categories for studying 'the user' of ICTs. Starting from the premise that ICTs as technical artefacts become usable and acquire their meaning only in a context of social practice and in relation to social systems of activity, this line of investigation proposes to penetrate through the 'mutual construction' approach where the phenomenon of use is conceptualised as a relation between the individual user and the technology. Tuomi proposes our analysis has to reconsider the way in which we describe the users so that we can make visible the social basis of meaningful use: *'Although users are commonly understood to be individual human actors, on a more fundamental level they can only be understood as agents that express socially rooted meaningful action. ...human actors who act in a complex but highly structured field of social practices'* (Tuomi, 2005:22).

Following this line of thinking, the adoption and use of new media enabled services, such as health care information delivered via the internet, becomes a question of either matching the product/service to a given form of activity – say information seeking in public libraries, or care provision to older people – or social learning, where customers and staff in local libraries or care provision have to learn how to use this service to develop new practices (cf. Tuomi, 2005: 28). This perspective is radically different from the currently dominant policy thinking that constructs older people who do not use the internet as incapable to get interested or learn due to properties/characteristics they (do not) possess as a result of their chronological ageing. I have argued this point elsewhere (Sourbati, forthcoming, 2008) specifically in relation to the situation on Sheltered Homes for older people, where lack of engagement with a new networked computer facility characterised the everyday routines of both the young care professionals and older customers.

When our focus is on the individual (non) users and how they fit new ICTs to their everyday routines we may lose sight of the relational and structured character of ICT use, and related matters of institutional capacity and the distribution of social resources that make technologies usable. Questions of social infrastructure, including the role of institutional settings in facilitating shared experiences and the role of significant others in introducing people to new technologies, are important in the development of new media literacies. As the Belfast respondent in the Ofcom Consumer Panel study reminds us, new ICT capabilities are learned. Children and young people in today's developed economies have learned and use computers and the internet at home, though peer groups and at school. Likewise, the majority of middle-aged adults use networked computers at work and at home.

Qualitative research into how older adults experience new ICTs has examined the role of significant others who mediate between the specialised knowledge and skills necessary to use new ICTs and the situation and needs of new users. Networks of personal contacts such as relatives, friends and other close relations in the local community can encourage novices to introduce new media to their lives, and facilitate their learning of new ICT skills by offering them practical assistance and support (Haddon and Silverstone, 1996; Wyatt et al., 2005). Another practice of mediated access is when someone's engagement with new media is through others – though personal contacts who act as 'proxy' users with regard to contacting others electronically by sending an email and using the web to access information (Selwyn et al, 2005:19;21). Proxy use was documented in the Oxford Internet Survey (OxIS, 2005:6) as practice that increases the likelihood of those with a basic knowledge of the capabilities of online ICT to use its benefits. Mediated access practices beg questions of investment in

human capital. The requirement for public policies to recognise the role and contribution of competent mediators and provide additional assistance and social support for those people who need it in order to use new media services (cf. Garnham, 1999).

Issues of institutional responsibility can pose enormous challenges to Europe's IS as they entail an anthropocentric approach to public policy making: A requirement to think beyond individuals in order to provide for its citizens. Market competition has surely proved effective at extending access to internet connectivity. However, electronic communications are becoming ever-more central to exercising citizenship rights (cf. Tambini, 2006) just as a basic level of education and welfare have been in the last century, we need to develop a wider sense of public electronic communications and their 'users'. The notion of citizen, and citizens' rights to information, has a collective dimension that cannot be reduced to individual choices in a marketplace.

Epilogue: Why we need an anthropocentric policy perspective

This paper was not about 'older people' but about ways of thinking about people in public policy making. In my examination of the position of older people in Europe's IS discourses I attempted to respond to Mallard's call (2005:52) to consider how our analysis of ICT use is liable to become connected to the very project which is analysed. Looking into how our public policies construct and position older people can reveal how fundamentally flawed can be the assumptions which underlie our thinking about technologies, users and age. Dichotomous, individualistic and age determined understandings of media access have consequences for public policy development. To allow this conventional representation of old age to influence public policy and e-service provision for new generations of old people may be to disadvantage them and to misdirect governmental and commercial resources. The implicit assumption that the newly old will be uniformly media literate is misplaced and can lead to other types of disadvantage. As new ICT services develop fast, the network and storage capacity required increases and the associated ICT skills and literacies become more complex, many of today's 'included' end users, for instance those with internet access at work and a home broadband connection, may be tomorrow's excluded. Policy development must re-conceptualise the 'user' of ICTs. Policy thinking along static notions of media access, dualistic notions of use and individualistic conceptions of the 'user' disregards the relational character of media literacy. In essence, the public policy problem is not the 'excluded' non-users. What is at risk is not today's unconnected individuals but social practices of access to information, public services, voice/expression and shared experiences of citizenship.

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Identification Of Community Practices And Co-Creation By Pre-Adolescents: The Case Of Ketnet Kick

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Abstract

The paper intends to construct a critical and nuanced image of online communities and their potential social implications for youngsters. For this reason we investigate what the concept 'community' means to children. We first take an interdisciplinary perspective to discuss theories on pre-adolescence and on communities. We investigate the determinants of (online and offline) communities and try to identify what children find important in a community. Are children engaging e-actors in the community landscape and if so, how are they dealing with it?

These insights are on the one hand based on a literature study. On the other hand we discuss some essential findings from research in the case study 'Ketnet Kick', a successful collaborative game developed by the Flemish public broadcasting company VRT (Flanders - Belgium) and gamesdeveloper Larian. First, diaries and questionnaires were used to identify the children's user profiles. Next, six focus group interviews and ten in-depth duo-interviews were done, with in total 71 children in Flanders (Belgium).

It is crucial that notions of online community and Web 2.0 concepts are re-interpreted for and by children. The context of the children's everyday life is a central factor in determining the media practices and needs of children. In this regard, we find applications designed for pre-adolescents – i.e. children between the ages of eight and ten – aiming at a sense of community through collaboration and co-creation of content. The act of communicating online is not the ultimate goal of these children. Rather, they strive for common experiences and are cooperating for common purposes.

1. Introduction

We are living in a network society (Castells, 2004). Digitalisation and online networks cause profound changes in mediated communication and media experiences. Social networks are becoming hybrid. New media developments like Web 2.0 and social software (e.g. MySpace) are lowering the threshold for participating and connecting online. They have the potential of reconfiguring social networks and vice versa. Internet services that enable community building have also become popular, especially among young people: they grow up using and domesticating these new media (Livingstone, 2002). Some scholars argue that currently, children develop into communicators at an increasingly younger age. Many online communities for children have been conceived, based on this notion.

Yet the notion of 'community' or network sociality is a very charged concept (Rheingold, 2000; Wittel, 2001; Turkle, 1995). Recently we observe an increase in interactive and community products and services for children: for example Taatu, Habbo Hotel, Kid City, the upcoming BBC project, Toyinima and the Belgian/Flemish case of Ketnet Kick.¹ Gaming, pre-adolescents and virtual social worlds are becoming central research issues.

2. Theory on children in online communities

We provide in this theoretical part a quick overview of the most relevant aspects related to children and communities. We start with an overview of the different dimensions that, in our view, shape a community. Additionally we give a short introduction of pre-adolescents and how they experience life. These two components will help us in analyzing one particular community case for children: Ketnet Kick.

2.1. Online communities

On the one hand digitalisation and online networks are causing profound changes in mediated communication and media experiences. Social networks are becoming hybrid, being mediated by social contacts as well as by technologies (e.g. instant messaging, mobile phone, texting etc.). Participation in communities becomes increasingly extended in the physical life (Fox, 2004). New media developments like Web 2.0 and social software (e.g. MySpace) are lowering the threshold for participation and connecting online. They have the potential for reconfiguring social networks. But also vice versa.

The internet becomes domesticated in people's daily lives, especially embraced as a communicative platform. It is not surprisingly that the internet is a place where people interact and develop communities, often referred to as online or virtual communities. Rheingold (2000) defined the latter as: *'social aggregations that emerge from the Net when enough people carry on . . . public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace'*. This paper will discuss the idea of online communities often viewed as new places for communication. Scholars like Castells and Wellman, argue that we live in a paradigmatic shift, for example in the way we are connected to each other. *'It is the shift from living in 'little boxes' to living in networked societies (Wellman & Hampton, 1999).'* People are always and everywhere connected in a positive feedback-loop, according to Wellman. *'The personalization, portability, ubiquitous connectivity, and imminent wireless mobility of the Internet all facilitate networked individualism as the basis of community (Haythornthwaite & Wellman, 2002).'* We are witnessing the emergence of 'networked individualism', where individuals are becoming the portal to social contacts and communities.

The meaning of the original concept of community is apparently becoming less valid and could need some adjustments in this changing context. In this paper we will investigate if and how the meaning of online and offline communities is different for children.

2.1.1. Towards an understanding of 'community'

Analysing the concept 'community' is not easy. Many scholars already have tried to make a definition. We see a community as a group of people that share a sense of community in a communal space, where interactivity can take place. In this brief theoretical part we quote the most essential characteristics of communities. This helps to analyse the different kinds of communities and to better understand the nature of the community under investigation.

Tönnies is the well-known pioneer for describing community and society as two overlapping social spheres (Fox, 2004). He makes the distinction between 'Gemeinschaft' and 'Gesellschaft'. The 'Gemeinschaft' is a tightly knit community of individuals, while the 'Gesellschaft' is a more individualized, dispersed society (Tönnies, 1957).

These notions were part of typifying the age of modernization of society, combined with the negative consequence of often-fragmented social contacts. Tönnies regards the decline of the Gemeinschaft - the place of real, organic contact - as a loss for mankind.

Place

The concept community is frequently linked with the connotation of a new kind of 'Gemeinschaft', thus a place where people interact intimately with each other. Tönnies stresses the importance of locality and a place where people can gather. For Tönnies, the ultimate form of a community is the rural village (Tönnies, 1957). We see place as a position in space, whereas space means a continuous area. Locality, however, is regarded as a place occupied by certain people or particular activities. It is more in the sense of an area or neighborhood.

Thanks to virtual media, however, it is no longer necessary for members of a community to be in the same locality. Nowadays the digitalisation and new media offer new ways to interact, but this evolution also leads to new patterns of time and space, referring to the notion of 'time space distancing' (Giddens, 1990). The way people meet and interact has thus evolved. The contexts in which the communities originate are changing (supra).

However the idea that place is no longer relevant for communities needs to be nuanced. The availability of a communal place is still important, yet this place can now also be a virtual one. The place can serve as a recognizable symbol for a community. Fox (2004) is convinced that a community is bound by place, which always includes complex societal and environmental necessities'. *'For an individual to be able to picture the virtual community, there must exist some semblance of a physical community system, or even a visual web content, from which he or she can begin to imagine a collective identity. Without the web content or graphical interface that constitutes a home for virtual community, it becomes difficult for an individual to create a communal picture in his or her mind, and as a result, it works against the very survival of the group (Fox, 2004).'* Our hypothesis is that this is also a very important aspect for online communities for children.

The interpretation of the concept of 'place' in a context of online communities is reflected in the online –offline continuum. The online sphere, which rather takes place in the virtual, is mediated, whereas the offline sphere, which takes place in the outside world, is physical. Often, a clear distinction is made between the online and the offline, but in reality this is not always the case. Online and offline spheres are most of the time intertwined, in creating one reality and not two different realities for community members (Wittel, 2001; Miller & Slater, 2000; Wellman, Hampton, 1999). Also Ward (1999) sees the online sphere not as an alien world, as something totally different and cut off from the real world. Both life spheres are part of the everyday life experiences of the user. *'The internet has become a part of everyday life, rather than a separate place to be (Howard, Rainie & Jones, 2003).'* Thus the concept of place can entail a virtual aspect (the online sphere) as well as a physical aspect (the offline sphere), which constantly influence each other (and ultimately) form one 'place' in the experience of the community members. Our hypothesis is that this kind of hybrid sphere is essential for the experiences of communities of children.

Imagined

The community takes form online and offline, but also exists on the level of the mind. Even Tönnies already described such a kind of community: *community of mind* (Li, 2004). The latter stresses the importance of a sense of community or the imaginative. The element 'imagination' transcends the physical and virtual place; we move into the individual and collective imagination, as Fox (2004) suggests. A community exists when it has a meaning for people. This is linked to the concept of 'imagined community' by Benedict Anderson (1983): *'All communities larger than primordial villages of face-to-face contact (and perhaps even these) are imagined (Anderson, 1983).'*

Communion

A community is only a community when the members experience it as something real. There needs to be a 'common feeling' or a 'will-to-community' (Fox, 2004). According to Reid (1995): *'The illusion of reality lies not in the machinery itself but in the user's willingness to treat the manifestations of his or her imaginings as if they were real'* (p. 166).

Members also have to be committed to the community. This commitment, or 'sense of community', is an essential characteristic. McMillan and Chavis characterise this concept as: *'[...] a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' need will be met through their commitment to be together (Meng, 2005).'* This sense of community has a positive influence on the way a community is experienced.

In a virtual community, this is even more the case. The members do not always have face-to-face contact. As such, they need to place trust in the community they are belonging to. More accurately, this 'sense of community' can be called the 'spirit of community', or 'communion': *'[T]he networks of people that constitute the community. This adds new incentive to the debate as it suggests that the spirit of community or communion that is found among networks of people is [...] more important than having a sense of place (Ward, 1999).'*

The sense of community stresses an important factor in today's experience of communities. It shows that mind and feeling play a central role in communities.

Interactivity

Communities, and especially online communities, are seen as a group of people that interact with each other in a communal place (supra). In the literature on communities, communication is often seen as an essential factor (Wilbur, 1997). Also Rheingold speaks in his definition of the importance of discussions between the members of the community (supra).

We suggest that the concept of 'interactivity' is more suitable. In the following part, it is shown that interactivity cannot be reduced to communication. It seems 'interactivity' can play an important role in bringing a community to live. Interactivity can be understood as the degree people have an influence, have choice and are empowered (Manovich, 2001). The different forms of interactivity can play a role in the experience of communities. We recognize user-to-user interactivity, user-to-documents interactivity and user-to-system interactivityⁱⁱ (McMillan, 2002). Interactivity is also a useful concept in comprehending the Web 2.0 story, actions of children and the possibilities for creativity. Our hypothesis is that user-to-user interactivity is not always required in online communities for children. For this we start from the notion of the imagined community.

2.2. The child: the player of games

This paper focusses on communities for children. Therefore, it is necessary to know more about the targeted age group. What are the characteristics of children and what are their visions on new media?

Children have always been a difficult research topic. Therefore, it is not surprisingly that there are different theories on the role and position of children in the network society. Often, children are reduced to almighty computerhackers or cyberkids, with the computer as it were a 'child's machine'. According to Katz (1997), children are at the epicentre of the information revolution and the digital world (Selwyn, 2003). For children new media, like internet and games, are no longer unusual or even 'new' but are experienced as everyday, natural objects and thus domesticated.

According to Haddon (2004) friends are an important factor in the adoption and of new media, and learning the skills to use them. Wartella and Jennings (2000) talk about ‘pervasive media’. ‘*The new media are becoming ubiquitous; that is, touching all aspects of children’s lives. As digital circuitry becomes smaller, cheaper, and more plentiful, and as computer networks become larger and more pervasive, new-media implementations are likely to show up anywhere, including the nursery and the playground (Wartella, Jennings, 2000).*’ They are in fact ‘early adopters’: ‘*As ‘early adopters’ of new media, children and youth are, in many ways, the defining users of the digital media (Hartman, 2003).*’ Therefore, it is important that we continue to listen to children and observe their innovative practices.

2.2.1. Towards an understanding of pre-adolescents

We have studied children in *middle childhood*, often called pre-adolescents (concept often used within the marketing discipline). These are children between 6 and 12 years old, an age group often overlooked in user research (Fine, 1987). Our study focusses in particular on the age group between 8 and 10 years old, who are considered as the ‘forerunners’ of pre-adolescence. It is however often stated that these children increasingly behave like adolescents (Lorré, 2005).

The age phase of middle childhood is a transitional phase, which makes it a difficult to research subject (Thornburg, 2001) since the children are evolving and changing: psychologically, physically as well as socially. Michael and Sheila Cole (2001) identify a number of biological characteristics that arise during middle childhood and which have consequences for the cognitive and social developments. They start from a ‘bio-social-behavioral shift’ at the age of five and seven, when an improvement in coordination and balance occurs as well as significant developments in the brainstructure and –functions, which coincides with the first years of schooling.

The social evolutions in pre-adolescence are the most pertinent: ‘*Children who are seven to ten years of age in these societies spend much of their lives in mixed-age groups caring for and playing with younger siblings and other younger children in their local communities (Corsaro, 1997).*’ Friends and other peer groups are becoming increasingly important. Children spend more time in places where they encounter friends. They are shifting from the environment of the family to peer groups. Their social environment is enlarged with school, sports- and youthclubs, which they can choose for themselves (Van Nes, 2004).

Members, participating in common activities or sharing interests, form groups. Mutual understanding and trust are important factors in this formation of groups. Children also show a tendency towards social participation. They mainly like to play together, but sometimes, for example, they exchange personal information or gossip. This kind of social behaviour is often seen as important for future social development (Cole & Cole, 2001).

Life for preadolescents is seen as one big adventure. They are very active and cannot stay focussed for a very long time. Their need to discover is facilitated by an adventurous world, wherein games form the centre. Child’s play offers an interesting insight in the development of children, as it often reflects the formation of social networks. Pre-adolescents evolve from fantasy role-play to rule-based play, which to a certain extent functions as a model for ‘the real world’. Non-verbal elements are replaced by verbal elements such as planning and reflection (Van Nes, 2004).

Children in middle childhood also begin to contemplate on the nature of friendship. They try to influence the composition of their group of friends: they ‘select’ children with whom they have a high level of coordination, which leads to more solidarity and more fun (Corsaro, 1997).

Three general characteristics – in correspondence to trends on the intellectual, social and personal plan – accurately summarize the essence of middle childhood (Hughes, 1999). The

most important evolution in middle childhood, on the intellectual plan, is that the child's reasoning becomes more ordered, structured and logic. This affects the child's play, which reflects a growing **need for order**. Secondly, schooling increases the child's social involvement with peers. Friends offer support, a role that previously was reserved for the child's family. **Being accepted by their friends** is of increasing importance for pre-adolescents, and is also reflected in play. Finally, there is the huge dare of growing self-awareness: they feel a need to demonstrate their talents, knowledge and possibilities to others and to themselves. Also in their play, pre-adolescents show a strong **need for 'industry'**. Young people love to show their talents to their peers. They show a strong sense for activity. These aspects are also essential to better understand how children experience communities.

2.3. Merging of online communities and children

Children increasingly learn how to use internet applications like e-mail and instant messaging for mediated interactions. In this respect, Tobin argues that online interaction is a means for children to share their worries and problems with others, something for which they do not always have the occasion in other environments, like school or family (Buckingham, 2002). The difference between online and offline interaction is an important element in online communities for children. According to Livingstone (2002), children integrate both kinds of communication in order to maintain their social networks. They move freely between both worlds, although most interactions are local (Livingstone, 2002). Thus, the internet positively influences children's existing social contacts instead of undermining them.

As such, online interaction is primarily used to forge 'strong ties'ⁱⁱⁱ (Subrahmanyam, Kraut, Greenfield & Gross, 2001). However, the internet also offers opportunities to form 'weak ties'. It is an environment in which one can meet new people, using applications such as MUD's (Multi-User Dungeons), chat rooms, multiplayer games etc. According to Livingstone (2002), Valentine and Holloway (2003) children are engaged in two-way interaction in 'the real' as in 'the virtual'. The real world and the virtual world are no separate entities. On the one hand the internet can be seen as a tool for developing online friendships. On the other hand others use it as a means to reinforce their existing offline networks or as a welcome addition to their offline hobbies: they like spending time surfing and 'looking in' here and there (Holloway & Valentine 2003).

The online applications often used by children are games. Games are also an essential aspect of children's lives (supra). Games are often regarded as applications that can only be played. However, Fromme (2003) states that games are frequently integrated in the social and cultural activities of the users. For example, children often play with or against each other, and friends often serve as the most important advisors in game-related issues. This contradicts the idea that playing games leads to isolation. They are integrated in the circles of friends and can originate more or deeper social contacts. *'Playing computer games has generally been regarded as an individual, more or less asocial activity, [...] On the contrary there is a wealth of social activity around the games, which are closely integrated in the social relations and cultural networks of the young (Jessen, 1999).'*

According to Jenkins, games offer now the same satisfaction and fun as before playing outside did: the exploration and knowledge of the environment, activities with a goal and self-control (Buckingham, 2002). Jensen (1999) states that children develop a specific culture in which one has to take part, in order to understand it completely. Children, in his opinion, form interpretative communities, for example around games. He uses football as an example to explain the concept of interpretative community: *'[...] cultural phenomena are quite dependent on living cultural, interpretative communities, and even if there are many differences between football and computer games, both are functions of social and cultural communities (Jessen, 1999).'*

3. The case Ketnet Kick

Within this research Ketnet Kick was chosen as a case to examine the community experiences of children of middle childhood,

3.1. Ketnet Kick

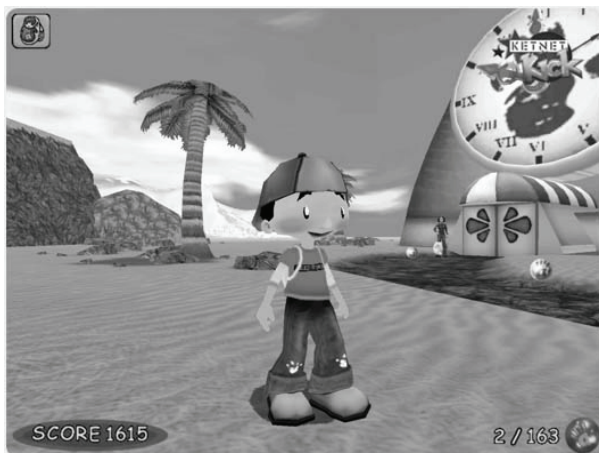
Ketnet Kick is developed as an online community in the form of a 3-D game for children between the age of 6 and 12. Especially children between 8 and 10 are the most frequent players. Being set up as a user-generated content application for children, it gives them the possibility to play games, but also make drawings, compose music, improve their dancing skills, create content. Ketnet Kick is designed as a feedback loop: children create content that is showed in the game, on the internet and on tv. Now children can see what the community of Ketnet Kick is creating and can get inspired.

In the case of Ketnet Kick, it is not possible to have user-to-user interactivity, but there is user-to-documents interactivity in the sense of creating content. One can also speak of user-to-system interactivity since the players can lose themselves in a 3D world. They have the illusion of empowerment.

Ketnet Kick is also based on a story. The purpose is creating a lot of content against Kroknet, the adversary of Ketnet, By creating an enemy one creates an opportunity for a sense of community.

The 3D world provides the aspect of place for a community. The 3D space online provides a place that they can love, feel and experience. It makes it tangible for the children. Ketnet Kick is a community that has more than 100,000 players and therefore consists of a large group of children who are connected online in a virtual world.

Figure 1: Ketnet Kick screenshot



3.2. Method

This research is situated in ‘the new social studies of childhood’: research ‘with’ children instead research ‘about’ children. (Greig & Taylor, 1999) Children are seen as competent social actors (Holloway & Valentine, 2003). Also Piaget cited by Greig and Taylor (1999) presents children as active ‘constructors’ of their own knowledge.

In order to get an in-depth insight in the everyday life and online activities of children, we used qualitative research methods. The aim was looking at the nature of the phenomenon, based on an explorative and inductive approach and by this discovering the community practices of children. How do children experience communities? What roles fulfill the dimensions: imagination and interactivity in creating and sustaining a sense of community?

These issues were investigated by the exemplary case: Ketnet Kick, developed by the Flemish public broadcasting company VRT.^{iv}

The recruitment of the respondents was carried out via schools. In this way our target group was already classified by age and was easily accessible as a group. However children are considered as an internally heterogeneous group. To make a distinction, the typology developed by Livingstone and Bovill (1999) was applied, which makes a distinction depending on how children generate their own style of media-use:

- '*Screen entertainment fans*': these children spend a lot more than the average amount of time in front of the TV-screen, watching videos and playing games.
- '*Specialists*': they spend more than the average amount of time using one specific medium. Three types are identified: the book fans, the PC fans and the music fans. During the research we discerned other types of specialists: the game fan and the MSN fan.
- '*Traditionalists*': They spend a lot of time with the traditional media (television, music, books,...) They spend less time using the PC and playing games.
- '*Low media users*': These children spend less time than the average on all the media.

Firstly structured diaries were distributed in six classes, spread over two schools. The diaries were used to determine the children's profiles and provided after fulfilment an overview of the children's activities. The data, collected from the diaries served as input for six focusgroups. We have done separate focusgroup with traditionalists, screen entertainment fans and specialists. Two complementary focusgroups were carried out wherein the respondents were separated by gender: one with just girls and one with boys. The sixth focusgroup was mixed in gender and profile.^v

The reason for choosing focusgroups as a method, is related to the fact that group dynamics play a central role when dealing with communities. '*Groups give children space to raise issues that they want to discuss* (Greig & Taylor, 1999).' However working with children expressed the need for interactive focusgroups, since they cannot stay focused for a very long time. Therefore, during the conversations, the children had the opportunity to make drawings of their thoughts and feelings, which were also used as input for the conversations. This is one of the reasons why we chose a case study closely related to the children. Conducting research on and especially with children is challenging. During the focusgroups, it was sometimes difficult to stimulate the discussion. In retrospect, traditionally focusgroups do not seem to be the ideal way to conduct qualitative research on children. There is a need for new and interactive research methods, since it is not so easy to receive information rich judgments from children.

The focusgroups were complemented with 10 in-depth interviews wherein two children participated. In these interviews the children were different from the participants in the focusgroups. The children in the duo-interviews had some sort of relation with each other (e.g. brother, friend,...). We chose for two people that know each other to enhance the dynamic of the interview.

3.3. Towards an understanding of the experiences of Ketnet Kick

The case of Ketnet Kick (KNK) enabled us to understand how these pre-adolescents make sense of their participation in an online community. KNK is not a community wherein children talk about common topics and interest, due to the lack of user-to-user interactivity within the KNK game. So it is not an ordinary online community like a forum, as it is often stated (supra). The data showed how children experience Ketnet Kick and what they find important.

Specific elements from the game, like the mysterious island ^{vi}, and new games are popular topics in offline conversations.

Iris (9 years old, PC-specialist): 'At a certain moment I was standing before a rock far away from me. I heard from a friend of school, that when you jump very far and when

you are almost falling, you have to jump again at the right time. Then it is possible to reach the mysterious island, because he has reached it yet many times. He even found a red bottle.

Int: 'So you think that children already have reached the island?'

Iris: 'If it is true off course'

It was amazing that some children started a myth around Ketnet Kick and that it lived between the children. The new and the mysterious are important topics of discussion for our respondents, especially among the children who are real fans. This means that Ketnet Kick is in fact part of their everyday conversations at school and at other places where they meet. This implies that KNK has received a place in the lives of people and that this fascination helps sustaining a sense of community.

The interactive feedback loop in KNK^{vii} also creates a possibility for a feeling of 'togetherness' among the members, especially in their battle against the evil Kroknet^{viii}. In this way we can say that all the children playing the game form an imagined community. In order to belong to this imagined and imaginary community, there is no need for direct contact: all gamers battle for their world, the world of KNK. They are fighting for a symbol. Here we see links with the way Anderson (1983) refers to nationalism as the basis for an imagined community: people do not need to know each other in person to love and even fight for the same country. They unite against a common, external enemy. Yet, similar to nationalism, not every member of KNK is equally enthusiastic. Some take the story very seriously, while for others, this is certainly not the main reason to play the game. Other children see past the magic of the game, and experience it as just a game they play for fun. The experience level is therefore not the same for every child.

Another aspect was the importance of the offline sphere wherein children hang out and spend a lot of time. There were children who were spontaneously talking about KNK, in order to get help in finishing the game.

Irani (9 years old, MSN-specialist): 'Sometimes, on the playground, he asks me: 'How far did you get? Do you remember how to get passed that level? Do you know what that means?''

Their conversations are mainly held among friends. In a game, challenge and satisfaction are important. It is essential that children are offered sufficient help, so that they do not give up too soon. It is remarkable that children partly accomplish this need by asking each other for help or by completing a level together. However this cooperation mainly happens offline. This is demonstrated nicely by the following citation:

Jonas (9 years old, screen entertainment): 'We always say: 'How far did you get in the cave game?', and the one who got the furthest gets a piece of candy on Monday.'

Int: 'How did you think of that?'

Jonas: 'We use it with games that have levels, like 'flying' or the cave game or the mystery island. Everyone brings three pieces of candy on Monday, and whoever got the furthest in one game, gets one piece of candy from everyone.'

Int: 'And who thought of that?'

Jonas: 'We were talking about the game, and at one point, someone said that we could do that.'

Int: 'That's fun!'

Jeroen (low screen entertainment): 'In fact it is stupid, because you can never prove that you got that far...'

Jonas: 'Yes you can! When you push F7, you can print how far you got in the game!'

They generally try to fulfil this need offline, by asking each other questions. Yet some children also use online channels for this purpose.

However there are also mechanisms offered by Ketnet Kick to help the children, like Star Square or the ‘Ket’ of the Day^{ix}, are in their own way, also effective. They can be seen as forms of indirect cooperation and are shaped by user-to-documents and user-to-system interactivity that provides alternative ways for helping the members of the community and sustaining the sense of community. In these kinds of interactivity lies the online community practice of the pre-adolescents. Thus, we conclude that Ketnet Kick is an interpretative community, mainly offline but also online, through co-creation, in which the users play and interpret the game together and offline friends are the most important game advisors. Jessen (1999) also stated that these kinds of communities often arise in a game context. This research confirms this and offers support to his concept.

Online, children are engaged in the imagined KNK community. The KNK-community is also sensed offline in small group of friends. Mainly they help each other and form interpretative communities around the game. Ketnet Kick can thus be seen as an imagined multi-platform and hybrid community (online as offline): on internet, television and around friends.

3.4. The appeal of Ketnet Kick for children

Since KNK is a game, it greatly appeals to children. As such, it is an appropriate medium to set up a community for the researched age group. As stated above, the element of play is regarded as more relevant to a community aimed at children than the element of user-to-user interactivity. The theory about children in middle childhood mentions the role of games in children’s live (supra). Jessen states this as well: *‘The cultures of games playing involves an ongoing construction of an ‘interpretive community’ and in this respect it may be better suited to the patterns of children’s play than older media such as books, which one is alone in consuming’* (Jessen, 1999). Our respondents play various electronic games, but also play a lot of games at school and at home. The interviews confirmed the importance of play for social contact between children. Play is central in the everyday life of children. Although pre-adolescents love to communicate, they perceive the play element as more relevant than communication.

Tieboo (8 years old, high screen entertainment): ‘You can also chat with your friends because you found a new game...’

Int: ‘Which do you like better: playing together or talking to each other?’

Nick (8 years old, PC-specialist): ‘I like playing more than talking.’

Int: ‘And can you tell me why?’

Nick: ‘Playing is much more fun than talking, because you can play with your friends and that is more fun. And else, you only talk to one person.’

The interactivity, in the sense of creating, is a useful tool to foster the online community for children. This kind of interactivity is more suited for children of middle childhood who love to be active. They are able to enjoy themselves in KNK.

Ketnet Kick also provides room for imagination in an adventurous world and that is just what the life of pre-adolescents is a lot about.

The data have shed a new light on the experience of communities by pre-adolescents and has put the role of user-to-user interactivity into perspective. The emphasis must lie on imagination, creativity and co-creation. The concept imagined community is appropriate here, but maybe this particular online community experience by children can be labelled otherwise: ‘imigion’, a contraction of imagination and communion. An imigion is a group of

children that has a sense of community and has a place as a symbol, but where the experiences of the group lie in user-to-documents and user-to-system interactivity.

4. Conclusion: towards the ‘netplay’ society?

In our analysis we focussed on pre-adolescents in relation to online communities. We conclude that online communities are to some extent experienced as an important new sphere in the lives of these young people, but we may not underestimate the value of the offline sphere. The online and offline are complementary and both have their specific values. In the case of middle childhood, it is important that we know which sphere provides which values.

We suggest that online communities are an environment, in which people can imagine and play. These are the most striking characteristics for children of middle childhood. The KNK study also demonstrates that online communities can exist without the need of user-to-user interactivity. These findings lead to the idea of an ‘imagination’, in which the emphasis lies on sense of belonging and imagination. The online community practices of the children are mainly situated in the creativity. Children also show a tendency to collaborate in this dimension and are becoming e-actors.

One can also notice that children bring the online community more or less ‘alive’ offline. This indicates the importance of locality and their close friends. If the community wants to be real in the minds of children, it needs to be linked to their own life and experiences; offline interactions can be very helpful. Often, children spontaneously give an offline extension to the online communities. This indicates the commitment to and appeal for the online community. The community lives and goes on in their local community of friends.

Middle childhood is a transitional phase and also in our research, we found some youngsters who were more active online than others. These are some indications for future research. How do the community experiences evolve in relation to age? Is the online component and need for user-to-user interactivity growing? Still we need to be aware that children remain children and they will always pass through the childhood phase. It is play (online and offline) that shapes the social network of children and with the incorporation of online community games for children in the social network. In the case of children we could re-interpret the network society as the *netplay society*. That is why games like Ketnet Kick can form a smooth transition between the ‘child’s world’ and the ‘adolescents world’. The concept, ‘imagination’, can serve as a bridge, to help children, step by step, learning to get involved with the interactive communities.

Central in this research is the combination of two disciplines to generate an interdisciplinary insight: child development on the one hand and the evolution of media and media audiences on the other. The findings acknowledge the current changes regarding child sociology and media use and provide insights on children’s digital experiences as a reference for media producers and parents. Moreover, this research stresses the importance of collaboration between researchers and new media designers. It is crucial that notions of online community and Web 2.0 concepts are re-interpreted for and by children. The context of the children’s everyday life is a central factor in determining the media practices and needs of children.

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ⁱ See www.taatu.com, www.habbo.com, www.kidcity.be, the upcoming BBC project, www.toyinima.be, www.ketnetkick.be

ⁱⁱ user-to-user: to interact with each other or computer-mediated-communication
 user-to-documents: the way people interact with content and content makers, the way active users interpret and use mediacontent.

user-to-system: it is the way people interact with the interface. For example: flow = people lose themselves in simulations, like virtual worlds.

ⁱⁱⁱ Related to the concept of Granovetter (1973), Granovetter (1983)

^{iv} See <http://www.ketnetkick.be>

^v The traditionalists contain 8 children of 9 years old, 4 girls and 4 boys. The screen entertainment fans contain 8 children, 4 boys and 4 girls. Two children have the age of eight and 6 the age of nine. The specialists is a

group of 9 children with 4 boys and 5 girls, 6 children of nine years old, 2 of eight and 1 of ten. The group is a combination of PC fans, game fans and MSN fans. The group with girls contains 9 children of nine years old. There are 4 traditionalists, 4 screen entertainment fans and 1 PC-fan. The group of boys contain 9 children, 4 children of nine years old, 3 of ten years old and 2 of eight years old. There are 5 screen entertainment fans and 4 game fans. The mixed group contain 7 children, 1 of eight years old and 8 of nine years old. There is 1 traditionalist, 1 game-fan, 2 PC fans and 3 screen entertainment fans.

^{vi} Mysterious island: a place in KNK where children are unable to go to. Children even created a myth because some children claim that they reached the island and told this to their friends.

^{vii} Children can make content in KNK and show it to other children through the game, website and television. The content can be an inspiration or a tool to make content on their own.

^{viii} Kroknet is the adversary of Ketnet (the public tv-station for children). The aim of KNK is to defend the values of Ketnet by creating a lot of content against the wraptors, evil crocodiles, which want to incorporate their tv-station.

^{ix} Star square: this is the main location in KNK. In this square creations of players of KNK are showed and available for all the players

Ket of the day: Every week a player of KNK is selected and his avatar is showed in the centre of the Star square.

Theoretical Approach To Humans As E-Actors Research

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Abstract

E-activity is one of the possible perspectives to study change in the relationships between society and ICT. The appearance of e-actors is a direct consequence of ICT dissemination, it can be studied within this framework of analysis.

There is still no holistic theory for studying the social impact of ICT dissemination.

Action-oriented multidisciplinary approach to research is discussed. Possibilities of several theories are considered: semiotics, noosphere theory, theory of sociocultural reproduction, domestication theory, and social portrait genre.

Different options “to draw” e-portraits such as e-portrait as a part of the social portrait, as a list of e-activities performed, as a type of user, etc. are discussed.

The pragmatic value of e-portraits is considered. They can be used in many different ways: to monitor the transformation of the service sector; to measure the social differentiation; to study lifestyles or other issues involved in the measuring and characterising the users.

E-activity as a part of the computer culture is analyzed. The importance of the cultural, informational, and psychological aspects of social dynamics is emphasized.

Today, dealing with digital information has become a part of our lives. For many years, we discuss the social consequences of ICT dissemination. The appearance of e-actors is a direct consequence of ICT dissemination. The most general definition of the social consequences is the social transformations that are related to the possibilities, rights and interests of a person. The main subjects of the social consequences research at the beginning of the 21st century are the information inequality, the usage of ICT by children and youth, the emergence of electronic networks, etc. / Haddon, 2004 /. Studying e-actors is a rather new direction of research, while being digital became resource for being successful. Looking at ICT from the point of view of its user has already a history of research but still has no theory.

Today, the concept “actor” is one of the basic sociological concepts; it is used as often as the concepts “subject” and “object”. E-actor is an actor acting in the electronic space. The very concept “actor” coming from the verb “to act” implies studying activity. There are individual actors representing nobody but oneself, there are collective actors representing institutions and organisations. A social subject as an active participant rather than the society as a whole became the subject of sociology in the second half of the 20th century. Bourdieu and Giddens are the founders of this approach / Bourdieu, 1979, Giddens, 1990 /. The concepts “social actor” and “social subject” are often used as synonyms too, but they are opposed in their relation to a social act. The concept “actor” has a meaning only together with a certain social act or acts, while the concept “subject” stresses the rationality of mind and one’s ability to make a choice. A subject can become an actor concerning some act, an actor can be

considered as a subject if certain characteristics of mind are present. In one case, some actors can have properties of subjectivity, in another case, only a part of the subjects can be actors of certain acts.

We can study e-activity in many ways, using different formats of behaviour research, consumption and media studies. A multidisciplinary approach with a set of “humanitarian informatics” tools is needed.

Several existing theories are appropriate for the e-actors research. The first general theory which is helpful to study e-activity is *semiotics*, the well known theory of signs, studying the parameters of different sign systems. The very concept “semiotics” was introduced by Charles Peirce in the second half of the 19th century and, at the end of the 19th century, natural languages were considered as sign systems / Charles Morris, 1983 /. Semiotics studies signs at three levels:

- 1) syntactical level studies the relationships between signs, the structures of their combinations, and the rules of signs transformation regardless of their meanings;
- 2) semantical level analyses the meanings of signs and the interpretations of signs and their combinations;
- 3) pragmatism level studies the relationship between signs and their users and interprets the messages carried by the signs..

These three levels are three interrelated parts of this science: syntactics, semantics, and pragmatics. Semiotics treats each sign system as a model of a certain fragment of the world. E-activity can be studied at all the three levels: purely technical (syntactical) level, semantical and pragmatism levels. Studying e-actors, we first analyze the relationships between the signs and their users. Pragmatism is an *action-oriented approach* to research /Mead G., 1938/. The word “pragmatism” comes from the Greek word “action”, pragmatic means practical. At this level of research, we correspond each concept with its consequences, all kind of consequences: applied, moral, imaginary, etc. / Dewey J., 1916/. For instance, from the moral point of view “correct” behaviour is the one that leads to the benefit of others and oneself. E-activity from this point of view is terra incognita. Nonethical behaviour in the electronic world includes types of e-activity such as dissemination of viruses with the help of e-mail messages, dissemination of the wrong information via Internet, declaring oneself the author of somebody’s information etc. The computer ethics is a new discipline. There are quite a few negative developments connected with e-activity which we do not discuss in this paper. There are not only the widely discussed problems of the information poverty, i.e. the problems of those who are underinformed but little studied problems of those overinformed. Another important problem is involvement of the actor into the world of illusionary communication. The progress of ICT makes the illusionary reality become more and more trustworthy and this makes it easy to cheat human psychology. The number of psychological and ethical problems grows.

The outburst of signs, the informational explosion is the essence of postmodernism. The postmodern tradition in the art and literature is similar to the postindustrial tradition in the economics and sociology. The basic features of the information environment in both cases are the same: fragmentary and eclectic character, no vivid borders, narrowing the realms of stable traditions; the acceleration of the development and enhancement of differentiation, enlarging information consumption due to ICT dissemination, etc. The slogan of postmodernists is: there is no reality, there are only descriptions of the reality; there is no truth, there are only versions of the truth. The truth is defined with the help of *utility*. There is nothing real as

everything has been fabricated. Signs are means of self representation. Everything has been constructed with the help of the language and can be understood with the help of the language.

The pragmatic level of the analysis becomes most useful when we analyze user aspects of ICT. There are two basic functions of the knowledge: “to know for the sake of the knowledge” and “to know to be able to do” / Teilhard de Chardin, 1987/. ICTs enhance the second, pragmatic function of the knowledge. E-activity is the activity in a fabricated world but consequences of this activity are quite practical, they happen in the real world.

Another general theory which can be used to study e-actors is the *noosphere theory* posed by the Russian Academician Vladimir Vernadsky at the beginning of the 20th century. *Noos* is “mind” in Greek. The concept “noosphere” was suggested by a French researcher Le Rua in 1926. Using this concept, Vernadsky developed a theory of the noosphere /Vernadsky, 1987/. He claimed that the biosphere is gradually transforming into the noosphere – a manmade sphere, an artificial non-natural world. The existence of this world implies the necessity of directing and regulating the evolution of the planet and the society using the intellect and knowledge. A man of the noosphere with his technical intrusion can easily break the natural equilibrium in many ways.

V. Vernadsky was a scientist, his theory is not well known among academics. Today the concept of the “regulated (controlled, directed) development” is mostly connected with ecological problems. But the “regulated development” is an alternative to the market non-regulated development in all spheres. Studying the social impact of ICTs, we know it is not always positive. Good, bad, or unexpected is the title of the conference we were participating in. The basic idea of the regulated development is the same for all the subjects and for all the countries - it is necessary to define the limitations (highest permissible values) in the sphere you are dealing with *to know what is not possible to do*. Global cooperation and global discussions should be in the basis of making decisions, V.Vernadsky claimed. Eighty years ago he said that the formation of collective intellect is vital for the humankind. Today electronic networks, commonly accessible data banks, and global possibilities of data exchange are indicators of the collective social intellect formation. To analyse the social transformations caused by ICTs, it is necessary “to educate one’s mind”. The acceleration of change transforms the society into an ever learning society. The rate of the technology change is constantly growing, which makes it necessary to learn all the time and to constantly update one’s e-skills. The life-long learning paradigm becomes important not only in the educational discourse. The ability to learn quickly becomes very important. There appears a new social differentiation between the “computerized “ and not computerized people, who have much less ability to learn quickly.

The regulated development can be implemented using all kinds of enlightenment programmes. The aim of such programmes is not only dissemination of knowledge but creation of a new social climate, of a special atmosphere in society. Cooperation becomes as important market force as competition when global common interests appear.

ICT helps to implement the “regulated development”, to control and to direct the development. The artificial world, or “technosphere”, or digital world is a part of the modern society, a part of the modern environment. There are new social trends, new standards of behaviour, new notions of comfort, new types of activity, new types of poverty, not only in purely economic, income terms but in the perspective of e-deprivation. *E-deprivation* is a new

concept. To have no computer is a deprivation in the modern society. E-poverty can be subjective - you are bothered by the fact that your PC is less advanced than your neighbour's, for instance. The time of ICT usage can also be an indicator of deprivation. Why are people hindered in their ability to go online? Have they got appropriate social networks in their lives? Indicators of e-deprivation can be different in different countries as they depend on what is considered deprivation in this society. The levels of e-deprivation can also vary. The very concept of equality is changing in the digital world.

The laws of social development change. the relations of usage rather than the relations of ownership are characteristic of the information society. To understand the digital world, we have to study a human being "as a whole", as a system.

The noosphere is the sphere of human activity, so it includes e-activity. E-activity is one of the possible perspectives to study the change in the relationships between society and ICT. The basic principles of the noosphere theory are most suitable for studying the social development and e- activity:

- 1) Awareness of the consequences is awareness of the future. Each human action has consequences, so a person should be always aware of the results of his/her activity, aware of different possibilities of his/her behaviour and consciously choose the most suitable alternative from the point of view of the future.
- 2) In order to survive in the artificial man-made world, a system of regulations and limitations of human behaviour should be developed.

Another theoretical approach is the Bourdieu's *work on social and cultural capital, on sociocultural reproduction* / Bourdieu, 1979 /. No doubt that change is here, we have more and more information channels, intensification of information exchange, a lot of new possibilities but there are stable things too. Each culture has its own models of the production and consumption of knowledge and information. The quality of informational flows depends on the national sociocultural features. *Stable paradigms* of the informational behaviour do exist, which are transmitted from generation to generation. The types of informational interactions are stable: people are either informationally active or informationally passive, interested or disinterested regardless of the informational channel. ICTs enhance the human possibilities but first they enhance them for informationally active people. Can we say that e-active people were always informationally active?

The ability to make a choice and to project one's lifestyle does not fully depend on ICTs, it is a characteristic of a person. To take a holistic view, we have to take into account that there are several basic lifestyles that can be characterized by different attitudes / Meyer, Schulze 1997 /:

- *traditional* attitude to the family and gender roles, established lifestyle with financial independence, conservative pattern of values for all areas of life;
- *emancipated* attitude to the family and gender roles, successful and consumption-oriented lifestyle with financial independence. A search for meaning and personal freedom within the social network, openness to new experiences;
- *achievement- and status-oriented* attitude, when profession and career take priority over one's personal and family needs, pronounced status thinking, pleasure in what is achieved through one's own efforts;
- *post-modern* attitude when the guiding principle is the development of the individual personality in the context of diverse experiences, rejection of traditional norms and values, heightened sense of communication.

E-actor can have any of these attitudes. Becoming a lifestyle in itself, e-activity combines different attitudes. It does not necessarily reject traditional norms and values, but the usage of ICT implies openness to new experiences and heightened sense of communication.

Behaviour of e-actors can be studied with the help of words (of language) and with the help of observing usage experience and human reactions. We can go beyond behaviour looking for the motivations, trying to understand why this action was performed. E-activity can be well charted using the domestication methodology.

The Roger Silverstone and Leslie Haddon's "*domestication methodology*" is one of the best known social theories in this sphere . It emerged at the start of the 1990s /Silverstone, 1996/. Domestication as a concept originated from anthropology, consumption studies, and modern media studies /Haddon, 2006/. All kinds of social processes around ICTs are studied with the help of qualitative methodology, in-depth interviews, and participant observation. How do patterns of use develop, how does a person find time for ICT usage are studied. The questions such as does ICT evolve conflicts in the family, is it used as a means of control, what are the ownership relations; is ICT treated as a threat or as a new opportunity by different family members, is it used for entertainment or/and for work, what do people do with the technologies and services, etc. are analyzed. With the help of this methodology, we study the significance of ICT to a person, construct the usage patterns, and study different social relations. This approach fits well for studying the e-activity of family members; it allows one to study different generations of e-actors, it corresponds well with other approaches. Case studies of households give rich in content evidence of ICT usage.

To conceptualize the e-actors research further, we have to combine different traditions of research. We can describe each e-actor with the help of his/her *e-portrait*. E-portrait is a part of the social portrait. The "social portrait" is a genre of sociological research in which the characteristics of a certain social group are described in maximal detail (for instance, "the social portrait of a young mother", "the social portrait of a believer", etc.) At first, such research implied questioning a big number of representatives of the chosen social group using a wide range of indicators. The idea was to get a full description of the social characteristics of this group.

One of the first sociological researches of this kind has been performed at the beginning of the 20th century in the USA; it was called "A Philadelphian negro". Living conditions, work, income, education, etc. of 9 000 negroes were studied for 15 months . Another widely known research of this kind is the social research of Pittsburg, 1909-1914, when the workers of the steel industry who comprised 80% of the city workers were studied.

Later, at the beginning of the 20th century, the Chicago school introduced another sociological genre – a case study. This genre is not based on large quantitative samples, though the objects are more or less the same. The characteristics of a social group are derived out of the single description of a case. Today, these two concepts are often used as synonyms and the "social portrait" genre implies both statistical and qualitative research.

We can use different approaches for constructing an e-portrait. The first one is a person as a numeral or rather as a number of numerals: the identification number, the individual tax number, the set of pin codes etc. which represent this person in the electronic world. Those numerals provide a digital identification of each person but the growing danger of the possibility of global digital control is widely discussed. Such a portrait is not very informative

for studying e-activity as a sociological phenomenon.

Another approach can be based on the *types of e-activities and their intensity*. There are several main groups of e-activities: retrieval of information, communication, organization of services (travel arrangements, booking tickets and hotels, buying goods, etc.), entertainment, and working. Each e-actor performs a number of activities, which can be listed and classified. One actor is all in e-business, another is in entertainment, still another uses a balanced list of different activities. Such characteristics like paintings give us a picture of a person showing what part of his/her life became digital.

It is clear that talking about the users as e-actors will completely differ along the lines of the user type. E-actors are people who have use for ICT, intensity of e-activity can be defined by the type of the user. There are many classifications of users, each says something of their actions on the net. Making use of different typologies, we shall have different e-portraits. Each class of users is a characteristic of e-activity.

We have new literacy, new ethics, new identities, new elites, new culture. Besides the two traditional types of culture: the culture of face to face, direct communication (the initial layer of culture) and the book culture (the culture of written language), a new type of culture appeared – the screen or computer culture. It is based on the convergence of the computer, video, and telecommunication technologies. The dynamic dialogical-type interaction between the computer text and the user is the main indicator of this screen culture. Interactivity, feedback with the screen is the basic change. This new type of culture is actively interacting with the two traditional types. This interaction leads to fundamental change in the culture, but it does not deform it- the computer culture is complementary to the traditional culture /Razlogov, 2006/ as it brings entirely new possibilities. What is new: a new type of communication appears, international by nature and a new type of thinking, oriented on self-development and combining logical and emotional. Computer skills are not enough, to conduct e-activity one has to have advanced information skills: awareness of an information need, definition of the sources of information, comparison of the information from different sources and choosing the best, using the information when making a decision, and disseminating it to interested people. There are many new qualities of e-information consumers: the ability to act in a transnational environment, the ability to collect information for the task, the ability to find colleagues in the electronic world, etc.

The computer culture is not only a screen culture; such new concepts as “digital me”, “e-self”, “e-lernt”, or “e-fit” imply new social phenomena that can be described with the help of e-portraits.

E-portraits can be used in many different ways. Studying the consumption of e-services we can monitor the transformation of the traditional service sector; we can use e-portraits as a measure of social differentiation; we can study e-activity as a lifestyle; we can consider e-actors at home or at their working places, we can study the issues involved in measuring and characterizing the users. There are many directions of the e-actors and e-portrait research. The humans as e-actors research is important both for the understanding what is happening to the social and economic life, and what effective practical interventions in the worlds of production and consumption of ICT can be made.

There are many ways of thinking about the humans as e-actors research covering a multitude of often non-reducible developments. The activities that were previously considered as

preponderantly technical, or economic, or cultural, converge. The importance of ‘creativity’ and ‘knowledge’ to the contemporary economic success gives a turn to an analysis of the psychological and cultural forms to be found everywhere. The importance of the informational, psychological and cultural aspects of the social dynamics is growing. There are more and more social and humanitarian problems caused by ICT dissemination. Fundamental questions about how to understand the transformation of the traditional life caused by e-activity are raised by scholars from the humanities, social sciences, media and management studies. The action-oriented multidisciplinary approach to the research is being born. E-activity is one of the possible perspectives to study change in the relationships between society and ICT.

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Attitudes Towards Mobile Phone Communication Technology

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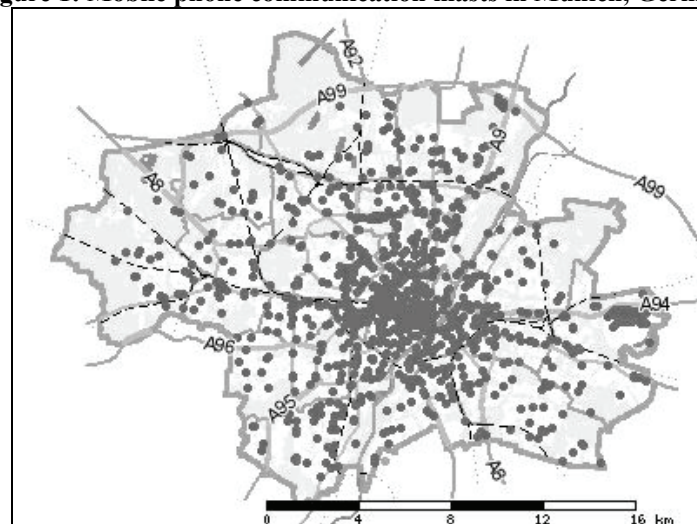
Abstract

Mobile phone communication is of great economic importance in Germany and the vast majority of people possess and use mobile phones. Although mobile phones are part of everyday life, a rising number of people share critical attitudes and express to be afraid of possible harming effects, mainly of masts. Within the discussion about possible effects attitudes often polarize. On the one hand people are convinced that limit values which have been set are save, on the other hand some people are sure about health damaging effects of electromagnetic fields. Mobile phone communication is quite differently socially represented in both groups. This paper will have a closer look at attitudes towards this technology which is so established in everyday life. Which concerns do people express? Are there gender differences? How is the impact of people's values? The paper focuses mainly on the results of the underlying empirical study.

Mobile phone technology in Germany

Mobile phone technology has influenced everyday life greatly, bringing along a lot of comfort. About three fourth of all people possess a mobile phone and there is nearly no place in Germany anymore, where there is no mobile phone reception (BfS, 2003). As an example we could refer to Munich. The following map presents all masts in the area of the city.

Figure 1: Mobile phone communication masts in Munich, Germany



Mobile phone technology is of great economic importance. The former government had sold UMTS-licences for about 51 million Euro. Thus, companies and politics are interested in the establishment of this technology. Many people share a positive evaluation of mobile phone communication, yet there is also a noticeable number, who are concerned about possible negative effects of living close to masts or of using mobile phones. To prevent people from

any harm, Germany has enacted a law. Article 26 BImSchV¹ refers to recommendations by the ICNIRP (International Commission on Non-Ionizing Radiation Protection), which allows e.g. for UMTS-technology 10.000 mW/m². This is higher than in some other countries, like in Austria, Italy or Russia.

Attitudes towards mobile phone technology in Germany

Attitudes can be derived from publications and the public discourse on this technology, and they are influenced by them in turn. Publications on mobile phone technology are quite polarised (Ruddat et al., 2005). On the one side, especially companies and politicians state that there are no proven negative effects at all and that the limits set are sufficient. On the other hand environment organisations, citizen's group and some physicians warn of negative effects of the exposition to electromagnetic fields. There are studies which do not find any proves for negative health effects (e.g. Takebayashi et al., 2006) as well as studies that hint that electromagnetic fields could lead to health problems (e.g. the European Reflex project, other studies are for example Oktay & Dasdag, 2006, Al-Khlaiwi & Meo, 2004). In general, studies mostly analyse either physiological effects of electromagnetic fields or they try to figure out the percentage of people who are labelled to be "hypersensitive" because they "pretend" to be affected negatively by mobile phone communication technology (Kheifets et al., 2005, Schütz et al., 2005).

Which attitudes could be found among the German population? In general, about 30% are (very) concerned about mobile phone communication technology, and 28% are (very) concerned about mobile phones (wik, 2005, Infas, 2004, I+G Gesundheitsforschung, 2002). How people develop attitudes towards mobile phone communication technology is a question of their *subjective evaluation* process. Studies show that several factors could influence this process (wik, 2005, Infas, 2004, I+G Gesundheitsforschung, 2001), e.g.

- importance of mobile phone communication in their every day's life,
- knowledge on mobile phone technology,
- knowledge that a transmitter station is close to home,
- sources of information,
- concerns about other risk factors,
- participation in citizen's groups,
- suffering from particular health problems,
- socioeconomic status.

Taking these results into consideration, our study aims to gather a deeper understanding of the construction of attitudes towards mobile phone communication technology. It includes most of the listed facets found in other studies to be relevant and it is extended for values. This aspect is sometimes analysed with reference to general risk perception (e.g. Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, 2004), yet none study is known in which the meaning of values for attitudes towards mobile phone communication technology was analysed. In general, we will have a closer look at gender differences. Figure 2 illustrates the factors which will be included in our further analysis.

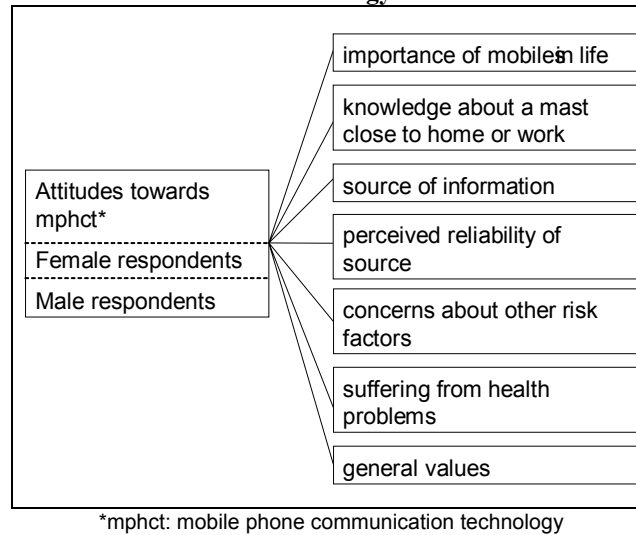
Study design

We conducted an online-survey on attitudes towards mobile phone communication. The following questions were included:

¹ BImSchV: Bundesimmissionsschutzverordnung.

- Where do people search for information about possible effects on mobile phone communication?
- How do they perceive the reliability of these sources?
- Do they know about any mast close to home or work? If so: How far are they away?

Figure 2: Factors which will be included in the analysis of attitudes towards mobile phone communication technology



- How do they assess general statements on possible health effects of mobile phone communication?
- Are people afraid of mobile phone technology?
- How do they assess other factors with respect to their possible risks?
- Do respondents suffer from any health problems?
- To which causes do they attribute them?
- Which values are important in their lives?

All in all, the questionnaire embraced 218 items. Usually, a six point scale was used, from 1 = “not at all” or “never” to 6 = “definitely” or “always”.

Respondents

During a six week period, 526 people filled out the online-questionnaire completely. Compared to other online surveys, this number of participation is not bad (Schütz et al., 2005).

62% of our respondents are male, 38% are female. Further characteristics of our sample can be drawn from table 1:

Table 1: Age and education of the respondents

Age	%	Education	%
- 20	1.5	none	0.4
21-30	13.5	primary and secondary school (“Volks- u. Hauptschule”)	6.4
31-40	22.9	secondary modern school level 1 certificate (“Mittlere Reife”)	15.4
41-50	32.1	vocational baccalaureat diploma (“Fachabitur, Fachhochschulreife”)	12.1
51-60	20.2	university-entrance diploma (“Abitur/Hochschulreife”)	16.6
61-70	9.2	university degree	41.6
71 -	0.6	conferral of a doctorate	7.5

As confirmed in another study (INFAS, 2004), in our study mainly those people took part, who are interested in possible effects of electromagnetic fields. These are men, people at the

age of 40-51 and with high formal education. Thus, this is a special selection effect which means that the case study only represents this group of highly interested people. Of course, the results presented are not representative. Representativeness is also limited due to the way of data collection via internet.

Subjective assessment of mobile phone communication

Our analysis will concentrate on different attitudes towards mobile phone communication technology. We will include cognitive as well as affective attitude components. Behavioural components will be left out, because it has proved to be very difficult to master the gap between intention to behave and behaviour in studies with a quantitative design like ours. Further we also added values. Values and attitudes differ in that way that values are more abstract and general orientation lines in life whereas attitudes are always addressed to something or somebody. Table 2 presents some information about study variables.

Table 2: Psychometric data and study variables

	No. of items	Range	Mean	SD	Coeff. α^*
gender (1: male, 2: female)	1	1-2	1.38	0.48	-
<i>importance of mobile phones in life</i>					
necessity to use mobile phone because of work	1	1-6	2.64	1.98	-
necessity to use mobile phone because of private reasons	1	1-6	1.75	1.34	-
<i>knowledge about masts closed to</i>					
home (1: no, 2: yes, 3: do not know)	1	1/2/3	-	-	-
work (1: no, 2: yes, 3: do not know)	1	1/2/3	-	-	-
<i>source of information</i>					
scholarly literature	1	1-6	4.27	1.82	-
TV	1	1-6	3.44	1.81	-
internet	1	1-6	5.03	1.44	-
radio	1	1-6	3.14	1.77	-
newspapers	1	1-6	3.99	1.73	-
physicians	1	1-6	3.65	1.80	-
citizen's groups	1	1-6	4.27	1.82	-
friends	1	1-6	3.86	1.68	-
church	1	1-6	1.38	0.97	-
politicians	1	1-6	1.79	1.34	-
environmental organizations	1	1-6	3.81	1.82	-
companies	1	1-6	2.18	1.56	-
scientists	1	1-6	4.52	1.55	-
<i>perceived reliability</i>					
physicians	1	1-6	3.82	1.44	-
citizen's groups	1	1-6	4.20	1.65	-
friends	1	1-6	3.84	1.36	-
church	1	1-6	2.19	1.30	-
politicians	1	1-6	1.67	0.96	-
environmental organizations	1	1-6	4.30	1.47	-
companies	1	1-6	1.85	1.19	-
scientists	1	1-6	4.01	1.31	-
<i>concerns about other risks</i>					
risk trait ²	22	1-6	4.35	0.79	0.90
<i>health problems</i>					
index of all health problems	33	1-6	1.53	0.82	0.86
<i>values</i>					
social acceptance	6	1-6	3.67	0.84	0.69
social commitment	3	1-6	4.28	0.95	0.67
religion	2	1-6	2.61	1.61	0.67
health orientation	3	1-6	4.74	0.97	0.62
family orientation	2	1-6	5.33	0.93	0.48
individualistic orientation	3	1-6	4.53	0.89	0.52
<i>attitudes towards mobile phone communication technology</i>					
pro mobile phone technology	7	1-6	1.84	1.09	0.84
neglect	4	1-6	2.45	1.22	0.60
anxiety	4	1-6	3.26	1.73	0.84
convinced about harms	3	1-6	3.32	1.70	0.73

* in case of two items, the correlation coefficient is displayed

² Trait to perceive various environmental factors to be risky.

First of all, we will have look at the mentioned factors that could influence attitudes towards mobile phone communication technology.

Importance of mobile phones in life

66% of all respondents possess at least one mobile phone. There is no gender difference. We included two items from which we can cautiously deduce the importance of mobile phones in life. The first one was: “I would be willing to refrain from using a mobile phone, but I cannot, because I do need it due to professional reasons”, the second one was “I would be willing to refrain from using a mobile phone, but I cannot, because I do need it due to private reasons”. More people need a mobile phone for work than because of private reasons. There is no gender difference for the first facet, but a significant difference for the second one. Women need it more for private reasons than men (mean women: 2.07, men: 1.57). This is probably due to the (typical) role of the women to care for the children and thus they might use it mainly for the purpose to be able to communicate with them flexibly. Yet, this is just a supposition which cannot be proved by our data.

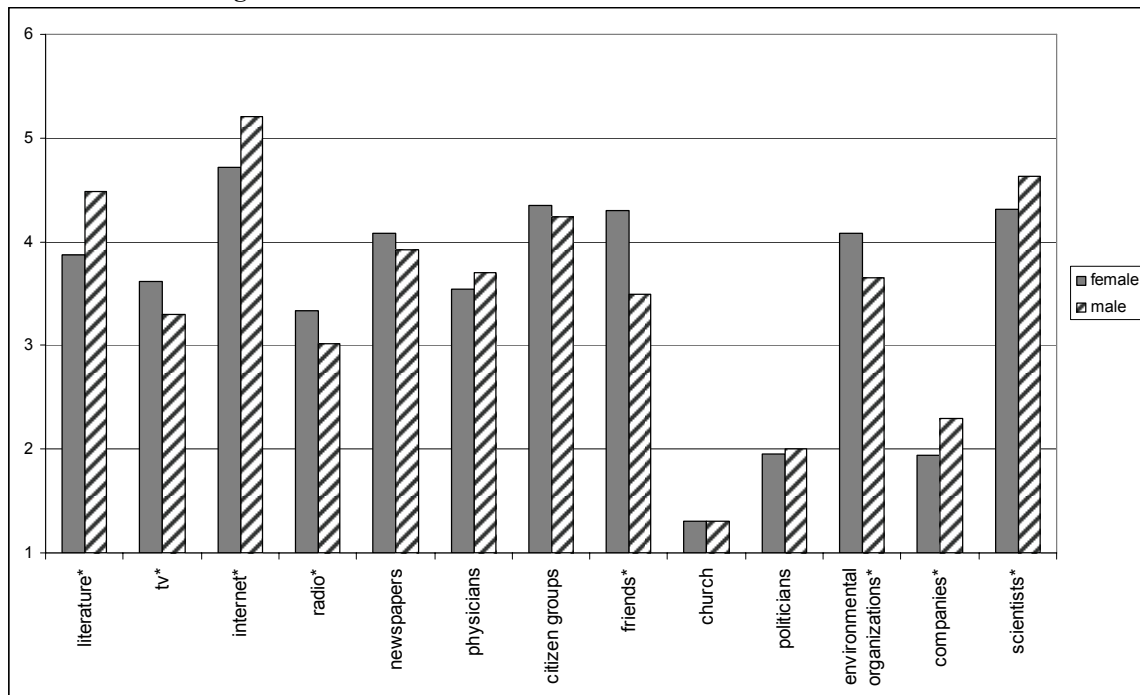
Knowledge about masts closed to work or home

Nearly 83% of our respondents know about at least one mast close to home, 8% are sure that no mast is close and 9% do not know whether there is any. The same was asked for the workplace. Here 72% state that there was at least one mast, 9% are sure that there is no mast close to it and about 19% cannot answer this question. There are no differences between female and male respondents.

Source of information and perceived reliability

Further, we asked from which sources people gather information about mobile phone communication technology. Figure 3 displays the answers.

Figure 3: Gender differences for different sources of information



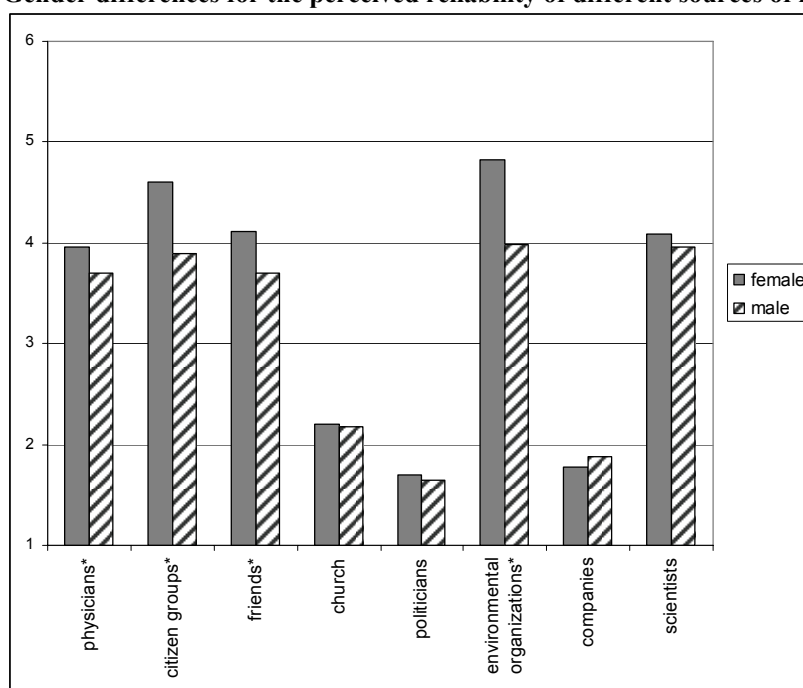
significant differences are marked with *

It can be demonstrated that most respondents use the internet to gather information. Here we need to take into account the way of data collection via internet. Thus, our respondents are used to use it also for gathering information. Further, a lot of respondents try to get information from scientists, scholarly literature and social organisations (citizen's groups or environmental organisations like the "Umweltinstitut" in Munich or Greenpeace). Comparably few use information provided by companies or the church.³

The ways how people try to get information differs between men and women. Our male respondents do significantly more use the internet, read scholarly literature, gather information from scientists or companies. Women rather use conventional media, like TV or radio. They also talk more to friends and look for information from environmental organizations.

The next aspect we should focus on is the perceived reliability of most of the sources (see figure 4). Our respondents tend to trust social organizations (environmental organizations, citizen's groups), scientists, physicians and friends. They do not trust information of churches, companies and politicians. Interestingly, the level of trust addressed to churches is even comparable to the trust addressed to companies. Politicians are perceived not be very trustworthy. There are remarkable gender differences for the trust given to physicians, citizen's groups, friends and environmental organizations. In all cases women do trust these sources more than men.

Figure 4: Gender differences for the perceived reliability of different sources of information



significant differences are marked with *

Other factors: Concerns about other risk factors and health problems

Concerns about other risk factors, such as nuclear power stations, air or water pollution e.g., are significantly more prevalent among women than among men (mean women 4.56, men 4.20). This tendency has been demonstrated by other studies as well (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, 2004). Further, we asked about health problems of our respondents. Women report slightly more health problems than men (mean women

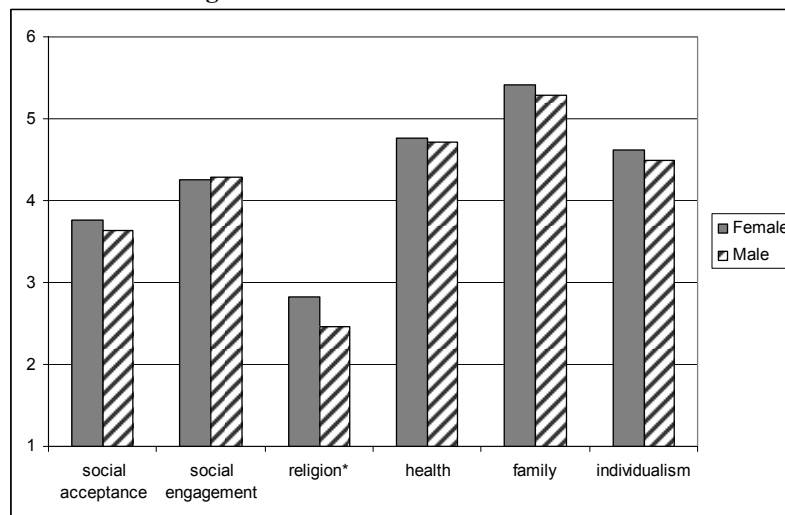
³ Some churches publish reports on topics which are addressed to health aspects or respond to anxieties among people.

1.61, men 1.49), yet this difference is not significant. We can carefully conclude that men and women of our sample do not differ with respect to their health in general, but in their risk perception.

Values

Next, we shall have a look at which value is how important for people⁴. Here we differentiate between women and men again (figure 5).

Figure 5: Gender differences for values



The most important value is family orientation, followed by health orientation and individualism. The next important value is social commitment. Social acceptance and religion are the least important values. There are not many gender differences. Only religion shows a slight but significant difference.

After the description of gender differences in these general aspects we can now turn to the analysis of concrete attitudes towards mobile phone communication technology.

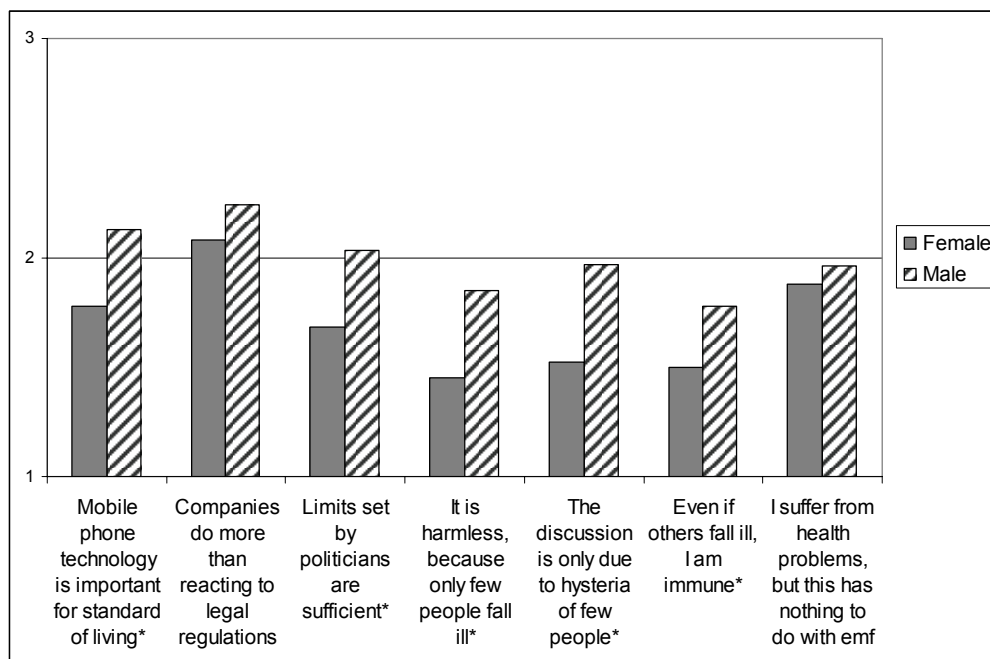
Attitudes towards mobile phone communication technology: positive assessment

About 15% of our sample share a rather positive view of mobile phone communication. 17% say that this technology is important for a high standard of living. 22% are sure that companies do not only react to what is legally mandatory, but care for people's health. 16% are convinced that the limits set by the German government will protect health sufficiently. Social cognition can be lead by representativeness heuristic (Nisbett & Ross, 1980). This means that people refer to a group they think to know and believe that this group is representative. In our study 14% believe that mobile phone communication has no harming effects, because they know only few people who are convinced to have developed health problems due to the exposition to electromagnetic fields. Also 14% think that the critical discussion about possible harming effects only takes place because of hysteria of just a few people. Another factor which could influence attitudes is the overconfidence phenomenon

⁴ The factors result from the question: "In your life, how important is it for you to..." The mentioned dimensions consist of the following items: factor *family orientation*: have a successful partnership, have or start a family; factor *health orientation*: be healthy and fit, play sport on a regular basis, to value a healthy environment; factor *individualism*: to be independent, have as much leisure as possible, to have lots of fun; factor *social commitment*: be engaged politically, engaged in activities supporting people in need, help others, factor *social acceptance*: be accepted/acknowledged by others, be attractive to others, have a career, be able to afford all those things one likes to have, job security and have a lot of friends; factor *religious orientation*: pray on a regular basis, be engaged in church/religious activities.

(McKenna, 1993, Weinstein, 1987): According to this mode people tend to underestimate the probability to be affected by negative incidents – it can happen to others but not to themselves. Optimism is especially high if they have not made any experiences with the possibly hazardous source, if they assess the rate of occurrence low and their own ability to control high. In our study, 12% are sure, they are immune to negative effects of masts, even if others fall ill. Finally, causal attribution is important. Information which can easily brought together with existing knowledge will be adapted more easily. Causal attribution can also be used in order to avoid cognitive dissonance. In general, people tend to assess risks more accordingly their own plausibility assumptions than because of statistical data (Versteegen, 1992, Nisbett & Ross, 1980). 15% report to suffer from health problems, but they are sure, that these do not have to do anything with an exposition to electromagnetic fields. In several studies on attitudes towards technology and risk perception gender differences are described (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit, 2004). Women care more for the environment, feel more affected by environmental problems and show more emotional reactions (e.g. anger) about it (ibid.). Are there also gender differences in our study? Figure 6 compares means of female and male respondents, while it presents all mentioned items that will be brought together as factor 1 in further analysis.

Figure 6: Gender differences for items of factor 1



emf: electromagnetic fields, significant differences are marked with *

It becomes obvious that more men than women share a positive view of mobile phone communication. Men assess the impact of this technology on the standard of living higher and have more trust in politics. Above, they are more convinced that the discussion about possible negative effects on health has been kicked off only because of the hysteria of a couple of people and that the technology is harmless as only very few fall ill. There are no significant differences for trust in economy and the statement to have health problems which are not attributed to electromagnetic fields.

First of all, we will turn to attitudes of women and analyse possible relationships with the aspects mentioned above and displayed in figure 2. It can be seen that there is no significant relationship between the importance of mobile phones in everyday life and a positive evaluation of it (factor 1). Positive attitudes differ according to the knowledge about masts close to people. If women do not know whether there is a mast close to home or work a

positive evaluation of mobile phone communication technology is highest (means in both cases 2.00) and lowest among those, who know about at least one mast (means 1.56 and 1.49). This could be explained easily: People who share pro arguments might not perceive masts because of selective perception or missing interest – they are not important for them. There are also several significant correlations between factor 1 and the sources women resort to in order to gather information. Women who are in favour of the technology do not inform themselves via the internet ($r = -0.38^{**}$)⁵, scholarly literature (-0.36^{**}) or newspapers (-0.18^*). They also do not talk with friends about this topic (-0.36^{**}) or try to get information from physicians (-0.19^*), scientists (-0.23^{**}), citizen's groups (-0.46^{**}) or environmental organisations (-0.28^{**}). Further, it is important how women perceive the reliability of these sources. Women who have higher values in factor 1 tend to trust companies (0.28^{**}), scientists (0.20^{**}) and politicians (0.20^{**}) and they mistrust citizen's groups (-0.52^{**}), environmental organizations (-0.40^{**}), and even their friends (-0.28^{**}). At the same time, women with positive attitudes towards mobile phone communication technology do assess other risks rather low (-0.24^{**}). There is no significant correlation with their health. The analysis of the relationship between values and this attitude reveals a significant positive correlation with the value of social acceptance (0.21^{**}), and negative correlations with social commitment (-0.30^{**}) and religion (-0.20^{**}). There are no significant correlations for the other values.

The same analysis for men brings along these results: A positive evaluation of this technology shows a positive correlation with the importance of mobile phones due to private reasons (0.19^{**}). It seems to be independent from occupational needs. In contrast to the results for the women, it is not important whether there are masts close to home or work. Besides, there are a lot of correlations of factor 1 and the sources used for information as well as their perceived reliability. In general it can be said that men who share positive views of mobile phone communication technology rely on information provided by politicians (0.15^*) and companies (0.27^{**}). They do not consult environmental groups (-0.28^{**}), citizen's groups (-0.50^{**}), physicians (-0.26^{**}) or even friends (-0.31^{**}). The same tendencies can be noticed for the perceived reliability of these sources. Like for our female respondents, also men who share positive attitudes towards the technology tend to have a relaxed view of other risk factors (-0.23^{**}). On the other hand, mainly healthy men rate high on factor 1, while suffering from an illness could also lead to a weaker support of mobile phone communication technology (-0.23^{**}). This tendency is also reflected in the correlation between the value of health orientation and factor 1 (-0.26^{**}). Social acceptance correlates positively (0.22^{**}), while social commitment shows a negative correlation (-0.13^*) with a positive assessment of the mobile phone communication technology.

Factor 1 shows a noticeable and highly significant correlation of 0.35^{**} with the next factor, which is called "neglect".

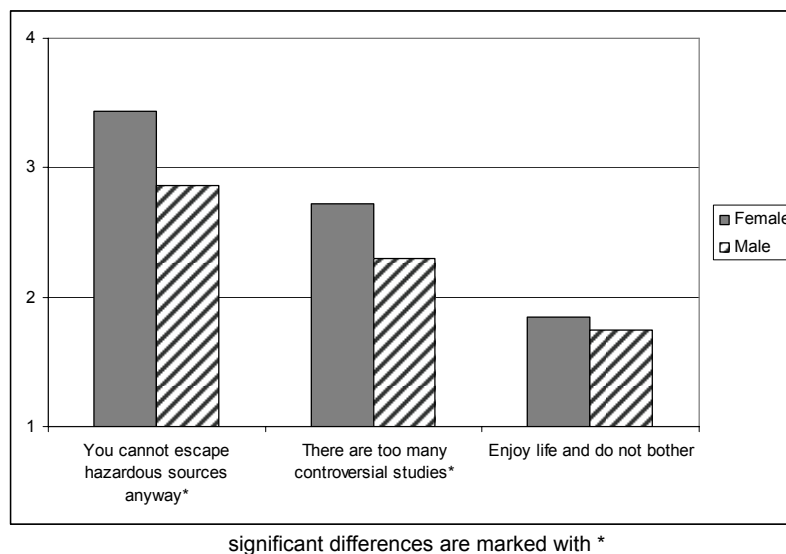
Attitudes towards mobile phone communication technology: neglect

People can share the view that is not only difficult to find out what effects this technology might have, but also that it would be better not to bother too much about this question. About 40% state that one cannot escape all possibly harming environmental hazards anyway. 18% do not know what to believe because there were too many controversial study results. 12% consent that it would be better not to think about possible negative effects of mobile phone communication technology in order to enjoy life. Again the answers of our female and male respondents are compared (figure 7).

Feelings of powerlessness and uncertainty are higher among women. Together with the abovementioned results this fits: Women are more sceptical about possible negative effects of

⁵ If not stated differently, Pearson's correlation coefficient is displayed in brackets.

Figure 7: Gender differences for items of factor 2



mobile phone communication technology and henceforth they do not support it as much as men.

For women, there is no difference with respect to the importance of mobile phones in everyday life. Those who do not know about a mast close to home or work have also highest means in factor 2 (means 3.28, 3.22) in contrast to those who know about a mast (means 2.52, 2.42). This is again a consonant result.

The correlations with sources for information are pretty similar to those for factor 1, but they are a noticeably higher for neglect. Women with high values on factor 2 do not resort to scholarly literature (-0.43**) or information provided in the internet (-0.38**) or by newspapers (-0.18*). They also do not consult citizen's groups (-0.38**), environmental organisations (-0.26**), scientists (-0.25**), physicians (-0.25**) nor friends (-0.27**). Women who share the above mentioned attitudes again rely on scientists and companies (both 0.21**) or politicians (0.16*), while they mistrust citizen's groups (-0.40**), environmental organizations (-0.26**) and friends (-0.24**). Again, there is a negative correlation between concerns about other risks and neglect, of course (-0.24**), and no significant relationship with health problems. Above, the correlations between attitudes combined in factor 2 and values are quite similar to those with factor 1. Women who strive for social acceptance (0.17*), but not for social commitment (-0.27**), religion (-0.23**) or who care not so much for health (-0.16*) show higher values on factor 2.

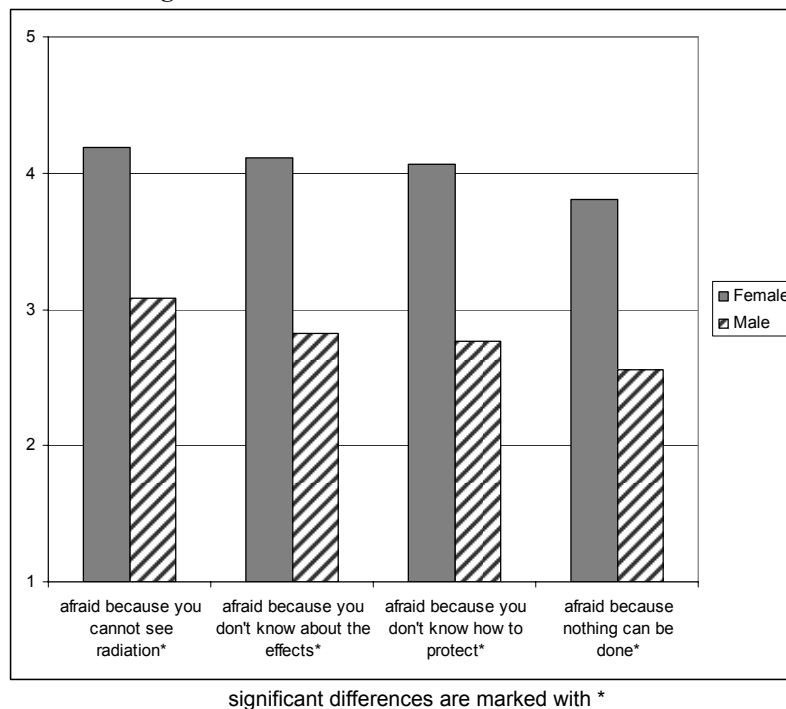
For men it is again relevant which importance mobile phones have in their private life (0.23**). Like for women the highest values for factor 2 could be found among those men who do not know about any masts close to their home or workplace (means 3.30, 3.01) – in comparison to those who know one (means 2.28, 2.29). Men who have high values on factor 2 do not use scholarly literature for information so much (-0.31**) or information in the internet (-0.29**) or newspapers (-0.12*), or provided by citizen's groups (-0.36**), environmental organisations (-0.27**), scientists (-0.21**), physicians (-0.17**) or friends (-0.18**). Men with high values in neglect value information provided by companies to be trustworthy (0.20**), while the sources citizen's groups (-0.31**), environmental organizations (-0.26**) and friends (-0.26**) are perceived to be untrustworthy. Further, neglect is higher among healthy men (-0.14*) with lower concerns about other risks (-0.17**). Similar to the results of women, socially engaged men who care for their health (both -.23**) have lower values in factor 2, while men who strive for social acceptance or who share individualistic values tend to neglect (0.13*, 0.12*).

Attitudes towards mobile phone communication technology: anxieties

While the last factor described uncertainty and a tendency of neglect, the next one will focus concisely on anxieties. The anxiety factor does not show a significant correlation with neglect (0.05), but a negative correlation with the first factor (-0.35**) and a positive one with the fourth factor (0.27**) which will be described later on.

The questions refer to being afraid of masts. 52% explain to be afraid of them because one cannot see the radiation. 47% are afraid because they do not know what effects electromagnetic fields might have. For 46% the source of anxiety is not knowing how to protect themselves. 40% are afraid because they are convinced that they cannot do anything against it. The analysis of gender differences brings along very interesting results (figure 8).

Figure 8: Gender differences for items of factor 3



Women are a lot more afraid of mobile phone communication masts in all four dimensions. The analysis of possible relationships with the aspects included reveal interesting details: Anxieties seem to develop irrespective of the possible importance of mobile phone communication technology in everyday life, or the knowledge about or sight of masts or of values. In contrast, it is relevant again from which sources women gather information: Information presented by newspapers (0.17*), environmental organisations (0.22**) or friends (0.23**) seem to aggravate anxieties, while information by companies are used to reduce them (-0.26**). Women who are afraid of mobile phone communication technology trust environmental organisations (0.34**), citizen's groups (0.33**) and their friends (0.17*). They express also more concerns about other risk factors (0.36**) and if they have health problems their anxiety level tends to be higher, too (0.21**).

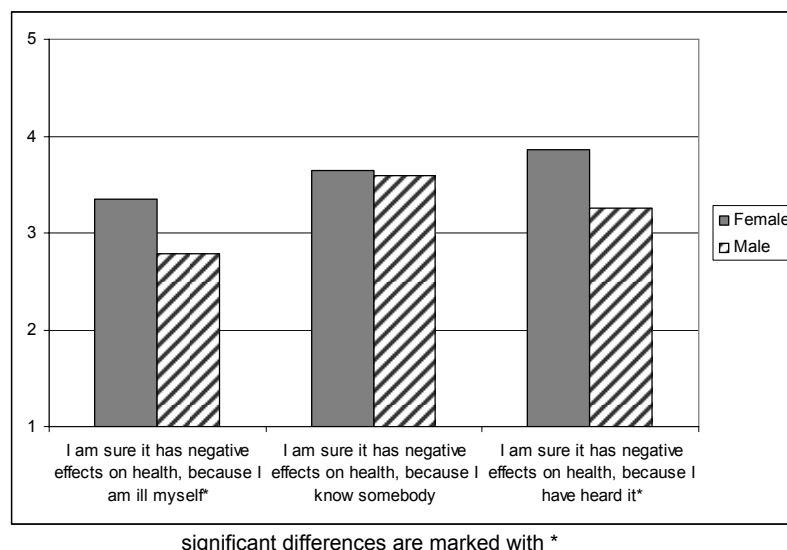
For men the importance of mobile phones has also no influence on experiencing anxieties. Yet, it depends again on sources of information: TV or radio reports (both 0.20**), articles in newspapers or the internet (both 0.13*), information provided by citizen's groups (0.30**), environmental organizations (0.26**) and friends (0.21**) increase anxieties. (Or anxious men seek information especially from these sources.) They do not trust politicians (-0.13*), scientists (-0.12*) or companies (-0.22**), but rely on physicians (0.18*), environmental organizations (0.35**), citizen's groups (0.34**) and friends (0.14*). The more they perceive other factors to be risky or the worse they suffer from health problems, the more they develop

anxieties (0.26**, 0.22**). While there were no significant correlations between anxieties and values for women, there are weak ones for men, in the case of religion (0.12*) and health orientation (0.15**).

Attitudes towards mobile phone communication technology: conviction that mobile phone communication damages health

This factor correlates negatively with the first factor (-0.59**) and the anxiety factor (-0.34**). Again, different factors which could influence social cognition were included. The first one looked at personal involvement. 40% are convinced that electromagnetic fields caused by masts damages health, because they have felt ill themselves. 52% know somebody, who fell ill because of the exposition of a mast, and are hence convinced that electromagnetic fields caused by masts damages peoples health. Again, the two modi of causal attribution and representativeness can shape attitudes. The weakest direct personal involvement is the case for those, who have heard that electromagnetic fields caused by masts can damage people’s health. 51% share this view. Gender differences are illustrated in figure 9.

Figure 9: Gender differences for items of factor 4



Women are significantly more convinced about harming effects of mobile phone communication technology in case they are affected by health problems themselves or if they have heard about it. There is no significant difference for the third item which is addressed to health problems of other people.

Critical attitudes of women do not depend on the importance of mobile phones in their lives. Women with high values on factor 4 gather information especially from scholarly literature (0.44**), provided in the internet (0.45**), TV (0.20*) or newspapers (0.25**). They consult physicians (0.24**), environmental organizations (0.30**), citizen’s groups (0.55**) and ask their friends (0.46**). They trust environmental organizations (0.41**), citizen’s groups (0.54**), their friends (0.46**), but mistrust politicians (-0.32**) and companies (-0.25**). Interestingly, they gather information from scientists (0.31**), but they also mistrust them (-0.17*). If women have health problems, they also tend to exhibit critical attitudes towards mobile phone communication technology (0.21**). Further, this correlates with concerns about other risk factors (0.26**). Socially committed or religious women have higher values on factor 4 (0.30**, 0.17*).

For men, there is no influence of the importance of mobile phones. There is also no difference with respect to the knowledge of a mast at work, but only for the knowledge of one close to their homes. Men who know about a mast there, have significantly higher values on factor 4

(mean 3.27 – in comparison to those who do not know about any masts 2.00). Again, there are a lot of significant correlations for sources of information and their perceived reliability. Critical attitudes go hand in hand with the utilization of scholarly literature (0.32**), the internet (0.42**), TV (0.25*), radio (0.20**) or newspapers (0.23**). Men who share these attitudes try to get information from physicians (0.24**, whom they trust 0.24**), scientists (0.21**, whom they – like their female counterparts – mistrust, -0.30**), environmental organizations (0.25** – trust 0.47**), citizen's groups (0.53** – trust 0.66**) and their friends (0.34** – trust 0.38**). They are not interested in information presented by politicians (-0.16*) or companies (-0.14*) whom they mistrust (-0.28**, -0.38**). Also for men there are positive correlations between general tendency to perceive different factors to be risky (0.31**) as well as for health problems (0.32**) and factor 4. At last, socially committed, religious and health oriented men tend to share critical views on mobile phone communication technology.

Conclusions

As presented in the beginning, the perceived importance of mobile phones differs between men and women when it comes up to using it for private reasons. While women explain more often, that they would need mobiles because of that, this does not show any correlations with the attitudes towards mobile phone communication technology which were analysed later. Yet, if men state that they would have to use a mobile phone for private reasons, they are also more in favour for this technology or show a higher degree of neglect. At the same time, the need to use a mobile does not influence anxieties or the conviction about possible harming effects of this technology.

If our respondents know that there is a mast close to home or work, they also tend to share critical attitudes towards this technology. Interestingly, this knowledge – or in other words: the sight of a mast – does not influence anxieties, the emotional component of attitudes.

Quite important are the sources, where people try to receive information, as well as the perceived reliability. Generally, women and men show different ways and intensities to search for information via different media or from different institutions or persons. The amount of trust is higher among women, while men seem to be more suspicious. At the same time, men are less concerned about several risk factors than women. This could already deliver an explanation why men show more positive attitudes towards mobile phone technology than women. Bringing this result together with the abovementioned statement of women that they would need to use it for personal reasons, one could expect them to be in a kind of dilemma situation: They “have” to use a mobile, but are more risk averse and afraid of the technology. This could lead to cognitive and emotional dissonances.

An analysis which sources are used let us conclude that scholarly literature and information provided in the internet are used for a critical reflection of this technology. This is the case for women and men. There is one exception: for both there is no correlation of the utilisation of scholarly literature and anxieties. The TV seems not to influence the establishment of a positive attitude or neglecting attitude, but it seems to be able to increase anxieties of men and to deliver proofs that mobile phone communication is harmful for health. Information provided by physicians, environmental organizations, citizen's groups and friends seem to confirm critical attitudes towards mobile phone communication technology. As demonstrated above this is also partly the case for information provided by scientists. The given correlations can be found for our female and male respondents. In particular, it is interesting to summarize the results concerning anxieties. Information provided by friends and environmental organizations seem to be able to aggravate anxieties of women, for men this is also the case, but here also significant correlations exist for physicians and citizen's groups.

Reliability of the mentioned sources are assessed differently: While information provided by citizen's groups, environment organisations and friends are perceived mostly to be trustworthy mainly by those who share critical attitudes about the technology in question it is labelled as untrustworthy by the supporters or those who tend to neglect. In turn, supporters (and those with high values on factor 2 – neglect) assess information provided by politicians, companies and scientists to be trustworthy. Yet, as we demonstrated above, information by scientists is often gathered by our respondents, even if they assume it not to be trustworthy. These results could underline that knowledge about and attitudes towards mobile phone communication technology are socially represented differently depending on the social system from which people gather information and depending on the observing groups, too.

A trait to perceive different environmental factors to be risky seems to influence all included facets of attitudes. There are no noticeable gender differences.

The women's support of this technology is independent of their health status. Yet, if they suffer from health complaints, they tend to have a higher degree of anxiety and are convinced about possible harming effects of mobile phone communication technology. Health seems to be more important for the attitudes of men – if they have health problems, they are not so convinced about the positive sides of the technology, they show less neglect, but they are more anxious and sure about its negative effects.

Surprisingly, attitudes towards mobile phone communication do not correlate significantly with the value of family orientation. Thus, our data provide no evidence that a critical view results from concerns about the family. Further, the value called here "individualism" also does not seem to be connected with most of the given attitudes. Only for men, there is a weak correlation between neglect and individualism. In contrast to this, we do find some significant correlations for social acceptance with the positive assessment of mobile phone communication technology and with neglect. This is the case for women and men. This might reflect the fact (as demonstrated by the mentioned studies above) that the majority of people share positive attitudes towards this technology. People who exhibit social commitment do not value mobile phone communication technology so positively nor do they tend to neglect. At the same time they are more convinced about possible harming effects of this technology. Only for anxieties there is no correlation with this value. Noticeably, the value of religion seem to influence more the attitudes of women than of men, who seem to be more lead by the value of health, whereat it correlates with all four factors for men. As social acceptance and social commitment are the main important values, it can be carefully concluded that social cognition of mobile phone communication is, above all, socially driven – especially for women. For men, individualistic values do also play a role as their attitudes are influenced by e.g. their own health or the individualism value.

Our analysis delivers some quite interesting results concerning attitudes towards mobile phone technology and a more differentiated and detailed gender comparison than most of the studies stated above. Apart from this, it also provided a clear picture of various socially represented information about mobile phone communication technology.

Yet, these results can only be used as a starting point for further studies. Our results are neither representative nor can they reveal causalities. Although the description of our results suggested sometimes to read them in a particular way, this is not proved by the data. All in all, it seems to be worthy to investigate attitudes under a broader perspective like in our study with different facets of attitudes. Further, it should be extended to include a representative sample while other ways of data collection should be applied, too. The best solution would be to undertake a longitudinal study.

Although some authors argue that only experts should be considered when it comes up to regulating technology (Nilsson, 2004), it could turn out to be difficult to enhance a technological development without recognizing what is happening in some social subsystems. Thus, also lay peoples perceptions should be taken into account (Stirling & Gee, 2003).

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Information Society As The Law-Governed Result Of The Evolution Of Information

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Nowadays the most advanced countries of the world are entering a phase of development which has received the general name of information society. The information society is the postindustrial society having essentially new increased information resources and possibilities. The information society may be considered as a result of combination of two lines of development, namely, the line of development of a human society as such i.e. first of all social, cultural, economic, scientific and technical and on the other hand (that follows from the name) the line of development of the information possibilities of society. While the evolution of human society has been studied comparatively well it is impossible to assert the same about the history of development and changes in forms and character of the information played its role in the whole process. In our opinion it is the evolutionary approach to the phenomenon of information that makes it possible to see more clearly the process of growth of information possibilities of the mankind.

The general idea of information. Today we freely operate with the circle of concepts connected to information as well as the ways of its storage and processing. Without special efforts, for example, we may differentiate and give definitions to various kinds of the economic and social information. As to the interpretation of the category of information as a whole, in generalized sense of this concept it is much more difficult business. The conception of information remains uncertain enough, and the term as itself is understood ambiguously by different researchers. Even from prominent scientists one has occasion to hear statements of the kind: "Actually, nobody can tell, what information is this ". At the same time the authority of information in the today society gets grandiose scales and more and more imperative character. All this forces us to perceive information as a phenomenon extremely capacious, many-sided and having almost mystical complexion.

Therefore, before building the system of conceptions related to the formation of information society, it is reasonable to try first of all to give more complete and understandable interpretation of the term "information" as such.

As a first approximation information may be defined as some data about things, properties, relations, phenomena, actions, and laws etc., which are required, perceived by some object or objects and used for realization of their purposes or requirements. In our opinion such not a strict definition being a representative of many other definitions of similar kinds is useful but insufficient. It is consumer's one and says very little about the nature of information as a phenomenon.

Phases of study and different notions of information. The term "information" has become current in the sciences and public life in the middle of XX century and has quickly found the widest application that confirmed the necessity and also timeliness of its appearance. However, some vagueness in the outlines of the concept, polysemy, the huge richness of content, have created significant difficulties in its uniform interpretation and selection of one common measure and universal unit of information.

Strong and weak points of the C.Shannon [1] approach and his followers, who connected the information, first of all, with the probability method of estimation of the reduction of the level of uncertainty during a choice, were already repeatedly discussed in the scientific literature and do not demand the further explanations. The attempts to construct a formal semantic theory of information based on the C.Shenon's ideas begun by R.Carnap and J. Bar-Hillel [2] and continued by a line of other researchers have not finally led to desirable results.

Undoubtedly an invaluable role in the development of information theory was played by researches and conceptions obtained on the basis of cybernetic ideas, the general theory of systems and consideration of information in the aspect of control (N.Wiener [3], W.Ross Ashby [4], L. von Bertalanffy [5] and others). After that the concept of information was interpreted as a tool of management and control or as data necessary to perform functions of systems, make up decisions and solve problems.

However, even those approaches, partly accumulated C.Shannon's principles, despite of their great theoretical and applied value, could not give answers to several important questions concerning, in particular, the correlation between the form and semantic contents of messages. They have not made it possible to develop a uniform measure and a more rich universal definition of information which could satisfy the demands of majority of researchers and users.

One more step was made in the study and comprehension of information after the appearance of informatics as the science of computers and other information technologies application. Shortly that science was divided into two branches: informatics of control and scientific informatics.

Nevertheless, one can conclude that theoretical concepts and interpretation of information existing earlier did not allow describe it completely and gave a possibility to estimate only separate sides and qualities of that major category. Attempts to overcome these boundaries are carried out today within the framework of scientific direction received the name of general theory of information, developed mainly by biologists and philosophers.

Concepts of the general theory of information. One of well-known experts in the field of general theory of information J.Jankovsky [6] writes:

"... during last decades the necessity has become obvious of the realized organization of processes of movement and analyzing of that which has got the general name "information". Meanwhile, the concept of information in many respects remains intuitive and receives different semantic contents in various branches of human activity".

Depending on solving problems, scientific directions, spheres of human activity and depth of philosophical comprehension this category may receive different definitions. In the Internet for example to day one can find the list of 34 formulations of such definitions and it undoubtedly may be extended.

The beginning of development of the general theory of information in our country in many respects may be connected to the name of A.D.Ursul [7]. In the West the biological views on information were presented first of all by N. Wiener and F.Machlup [8], however the papers of those scientists mainly examined the opinions of western representatives of the biological science.

To the representatives of the general theory of information as a direction of researches, in our opinion, can also be attributed V.I. Vernadsky [9] (though the scientist himself did not assert that). Scientific predictions of Vernadsky, contained in his ideas of the noosphere – that is the state of biosphere which comes out as a result of interaction of its laws with the activity of human mind and concerns global consequences of informatization process. This idea is completely coordinated to the modern notion of information society as the society characterized not only by high level of informatization and value of knowledge in the economy and in social life, but also as the postindustrial society, taking place on the qualitatively new coil of social and economic development.

In his developed complete doctrine of biosphere as the alive substance organizing the terrestrial capsule, and of the evolution of biosphere into noosphere V.I.Vernadsky unites in uniform process and analyzes in common the biological life and the life of human society. In his theory, examining the interrelation between the informatization and the biosphere, he attaches determining importance to the informatization and knowledge.

The great interest is deserved by the definitions offered by today's representatives of the general theory of information, in particular, of its teleological direction. So S.J.Jankovsky

associates the category of information with the concept of information interaction. He writes: "Any interaction between objects during which one object gets some substance, and the other does not lose it, may be named an information interaction. In this case the transmitted substance is to be called information " [6].

Concept of the operator of information. Creating his teleological theory of information, V.I.Korogodin [10] proceeds from the situation of achievement of some event as the purpose, from the concept of purposeful action and its complex characteristics, and also from the operator of information formed for the achievement of this purpose on the basis of concentration of the necessary information. The information is defined as the set of rules, methods and data necessary for constructing the operator of information, formed for achievement of the purpose under consideration. The concept of the operator of information is also used by other experts working in the field of information theory. So E.Sosnin [11] writes: "Information is a set of receptions, rules or the data necessary for construction of an operator. In other words information is the guide for action ".

The evolutionary approach and the rise of information in the nature.

The essence of information may be better understood and interpreted by observing it in the process of evolution. The information is inherently connected to the existence and ability to live of living organisms including human beings and also societies. It is necessary not to forget, that information in particular considered historically in its evolution is not only a social, but also biological, and even, first of all, biological phenomenon. In an integrated view this evolutionary chain looks like as such: the biological information, transition to the social information, its gradual transformation into the major resource of society (informatization), formation of the information society and, finally, creation of the noosphere as a new stage of development of the biosphere.

The offered approach can be considered as the evolutionary concept of research and interpretation of information within the framework of the general theory of information.

Contrary to the opinion of many scientists who notices in the nature three super-categories: matter, energy and information, information does not belong to the super-categories of this level. It should be regarded as an attribute of only the alive matter, not of the matter in general.

The present forms and kinds of information interesting for us, i.e. presumably social information, which after its development has turned from the biological into the social one, was generated together with the origin of life. Life has arisen at a very complex, close to unique, combination of conditions (temperature, pressure, chemical compound of environment, gravitation, presence of energy sources etc.). Directly opposite to the lifeless matter which is indifferent to states it passing through: firm, liquid or gaseous, alive organisms may exist only in rather narrow limits of values of these conditions and their combinations. They must adapt in order to maintain homeostasis. According to that living creatures were initially supplied by the nature with the aspiration to self-preservation and survival. Apparently, this aspiration marked the beginning to the phenomenon of purposefulness in the nature.

In this connection living creatures were provided with sense organs, the memory as an ability to fix the important events and situations, nervous system for the reaction to external disturbances. In result living organisms got an opportunity to perceive, register changes in external conditions and react to them. It was those data about conditions and changes in the environment which formed the basis of the initial information and served as the starting point for creation of information of the next subsequent types.

According to C.Grobstein's theory [12] "the strategy of life" consists in the constant development of living matter representing steady, creative evolutionary process of its antagonism to "monstrous power of the lifeless nature". From here we may judge, that life always should adapt to big and small changes of the environment and make it until the values of these changes obtain catastrophic character and became unacceptable from the point of

view of the limits of short term possible alterations in the structures and properties of alive organisms. The continuous reception of data about the environment serves the base condition for their survival and development

Thus, originally information was the need and consequence of adaptation of living organisms to changes in the environment conditions. Further, together with their development in the courses of ontogenesis and phylogenesis, in their struggle for existence and energy sources, during training and mutual informing the growth of abilities in processing and accumulation of information took place. With development of the nervous system and acquire by animals of that K.Lorentz [13] named "parliament of instincts", living creatures got new possibilities for the effective use of information.

Almost in the same way considers this problem biologist V.I.Korogodin. He writes: "...our conviction in that, information is the basis of life, represents, in its essence, only ascertaining of this fact. We should note, that in the nature there is no any information system which, if not being alive, was not made by hands of the human being " [10].

Academician N.N.Moiseev, even more definitely considers the information to be an attribute of the living matter. Arguing about the information, he writes: "...this concept (information) is imaged by me as somewhat "historical ". Necessity of its introduction arises only at the description of rather late stages of development of the material world, only when life arises in it. The information appears only when we begin to study purposeful objects i.e. objects capable to act purposely "[14].

Thus, from our point of view, information is simultaneously an attribute, a need and a product of ability to live of the living matter. Information has arisen and was originally used in connection with the need of living organisms to adapt for changes in the environment.

Information in the processes of ontogenesis and phylogenesis. For realization of their general strategy and performance of vital functions living organisms must have data about the condition and changes in the environment. That results in development at them devices for perception, processing and storage of these data i.e. sense organs, nervous system and at last brains. Living organisms were also provided with the emotional complex for the initial estimation of the importance of received signals and production impulses for necessary reactions to them. The fixation of reactions to coming signals was necessary both first from the point of view of survival and adaptation of separate organisms during their life (ontogenesis), and secondly for actualization of the long-term mechanisms of heredity and adaptation in populations, genus, species, orders and other biological groups (phylogenesis).

Development of the living matter is, certainly, not only the result of its opposition to the lifeless nature as well it is the consequence of its interaction with the biosphere. "Heterogeneity of the biomass is the result of its prolong interaction with biosphere – the interaction which essence is the self-doubling of making the biomass units based directly or indirectly on replication enclosed in molecules of information " (C. Grobstein, 1968).

For successful struggle for survival between separate specimens and different kinds of living creatures they should be supplied both the current situational information and the stored long-term information. The later is also promoting a choice of rational variants of reaction to coming signals and disturbances. The long-term information here is that accumulated during life of organisms (life experience), and also transmitted from generation to generation at the level of genetic hereditary attributes and acquired instincts.

There is some kind of competition between long living and short-living kinds of living beings. Here again nature provides the reliability of development of biosphere with the help of application of various ways of adaptation. Long living organisms for the period of their life are capable to save up more experience, than short living, but organisms with short period of life have an opportunity to provide faster transfer of the information saved to the subsequent generations on the genetic line.

For the recognition of coming information and proper reaction to them the memory of living beings must have registrations of various kinds of relations and already happened

events. On the basis of these registrations, and in particular on condition of their repeatability and high intensity of emotional colouring during their perception, reflexes living beings began to be formed.

During development the nervous system and intelligence of living creatures became more and more complicated and they got new possibilities.

At the same time their life experience and that partly transmitted from the previous generations summarized which found its expression in complication and increase of the number of their instincts. Created by that experience (conditioned and unconditioned reflexes) and named by K.Lorens's elegant phrase "the parliament of instincts ", together with the improved nervous system and the saved genetic information became, apparently, the main constituents of the basis on which, in particular after the occurrence of natural language, the process of formation of logic and human abstract thinking began.

Transition from the biological to the social information. It is possible to distinguish several stages in the development of forms of existence, perception and use of information. Firstly, it was the initial natural image information directly perceived with the help of sense organs. Then it was followed by the indicative (attribute) information, i.e. information connecting some phenomena together, for example, a flash of lightning is an attribute of a peal of thunder following behind it.

The signal-communication information arose in biological groups: broods, flocks, packs, herds. Firstly it may be warning shouts of alarm, exclamations of pain or, on the contrary, satisfaction. The modeling meaning of such signals (necessary reactions to them) was registered in the memory of animals together with them, at the beginning in the operative, and then in the long-term memory.

The ability of transformation of received signals into signs meant already transition to more high level of communication, and, in many respects was the consequence of growth of number and simultaneously intelligence of members of the community. Signs may be considered as signals with fixed for them and accepted by the community meaning

The growing number of living organisms and formation of different kinds of communities, realization of their mutual actions, increase of frequency of contacts between them, and perfection of their abilities to percept, recognize, store and process data, intensified the information interaction activities. The gradual transition was carried out from mainly signal, primitively sign forms of communication to the formation for this purpose and use of more and more advanced signs and whole sign systems.

"Evolution of sociums (communities) is connected just to the development of means of information interaction of its participants, and in particular of construction and use of their combined memory. The speed of this evolution is much higher than the speed of evolution of individual organisms. It is connected with that the means of information interactions used by a community may include not only means integrally inherent in its members, but also introduced in it from the outside. Advanced communities may purposefully develop external means of information interaction used by them " (Ursul, 1998).

The basic type of information used in the human society is the information expressed in natural languages. One of the characteristic features of the language information is that it may be analyzed on three semiotic levels: syntactical, semantic and pragmatic (Morris, 1983; Cherry, 1964). The development of languages passed several important stages each of which increased to an important extent possibilities of communication between people in space and in time. Main of those stages were as follows: spoken language, writing and book-printing. Now the natural language and language information have entered a new stage of existence – an electronic and digital one.

On the final account, it was the formation and use of language which made the information: perceived by all members of communities, freely enough transmitted in time and in space, suitable for use in different sorts of communities and society in general, i.e. allowed transform it into the social information.

Informatization and the formation of information society. Several last decades was the period when the information engineering and technologies were developing impetuously. The accumulation of knowledge was intensified, possibilities and the significance of their use in the human and society life increased. This process should result and has already resulted in the informatization of society, and further in some cases in the formation of information society. "The informatization of society is understood now as the process of more and more full mastering by the society information as a resource of development by means of informatics with the purpose of cardinal increase of the intellectual potential of civilization and on this basis - humanistic reorganization of the whole live and activities of the human being" (A.D.Ursul [18]).

Our vital activity to a very high extent consists of reception, storage, transformation and transfer of information. Very many of our physical actions, anyhow, are also connected to the processing of information. Constantly progressing processes of informatization gradually relieve people of the increasing number of physical operations connected to the processing and use of information. The impact of informatization is so radical, that it may even bring some people to the hypodynamia. Though, certainly, the main impact of informatization consists in releasing the intellectual apparatus of men from routine operations and in increasing opportunities for creative work. Now informatization is understood as the development and application of the most advanced means and technologies of information processing, first of all, electronic and digital, including computers, Internet, mobile telephones, united by the general name of "information-communication technologies".

But informatization notion may be understood more widely - as a general historical process of perfection of human abilities to process information. In this case one may also attribute to the informatization the invention and application of writing, book-printing, telegraph, telephone, arithmometer etc. As it can be seen, the paradigm sequence: "information - informatization - information society" has its historical principle of construction. In detail the initial part of this sequence looks like as follows: originating of information - development of the biological information - transition to the social information - past stages of informatization - modern electronic and digital informatization.

The next step of informatization is the information society. We speak about the information society when we mean first of all social and economic aspects of development of mankind, and we name this stage of development as knowledge society if we emphasize the information-intellectual saturation of society. Under economy of knowledge as a constituent of the information society it is reasonable to mean, first of all, such an economy in which the share of knowledge in the structure of total cost of the national product considerably surpasses the ratio which generally takes place now.

Major kinds and the general definition of information. As researches show, to the major categories of the information it is expedient to attribute first of all the following: current information, knowledge and genetic information.

A Russian philosopher G.B.Zhdanov [15] who distinguishes three kinds of information in the context of his reasoning: genetic, logic and figurative, defines the former in the following way: "The genetic information enables an organism to carry out the special, characteristic only for the alive matter way of its self-organizing, in particular, providing preservation and transfer in time the data and programs of adaptation, adequate reaction and development of alive organisms".

In initial biological sense the reception of information is, first of all, the process of scanning and perception by an object the conditions of environment and their changes, with allocation of elements, significant from the point of view of realization of strategies incorporated in it by the nature. The data received as a result of this process is the current information. These data may influence on the perceiving object in various ways: to cause only an emotional reaction, to require in the answer some physical actions, to promote structural –

functional restructuring of the object, and also may be accumulated, collected and inherited. Almost the same properties and functions (excluding the last) also form the basis of the current social information.

As to knowledge, today both everyday life and scientific knowledge are received and stored data about objects, processes, phenomena, laws of the nature, and also about their presence, properties and relations, allowing receive or improve our comprehension of them. Usually knowledge is considered as the long-term potential information, however in some cases (for example, some discoveries) it may be used at once after its reception. Scientific knowledge is the result of process of recognition of environmental reality. This process is very well determined by Herbert von Klaus [16] who writes about knowledge as of "...perfection of the structural model of the world ". Scientific knowledge is that kind of information which, as is known, makes a basis of scientific, technical and social progress of mankind. An interesting approach to knowledge as to a resource was shown by F.Machlup and M.Porat [17]. They offered the methodology and a mathematical procedure for estimation of the contribution of knowledge in the total cost of national product. In that project V.Leontiev "input-output" tables and technological factors were used.

During evolution, beginning from the time of appearance of primitive alive creatures and up to now, kinds, forms, the role and significance of information, and also the range of spheres and directions of its use were changing and extending so much, that now it is practically impossible to give this concept a uniform, universal and strict definition. Such definition should unite its biological, social and even technological sense. Attempts to develop such definition (for example C.Shannon's and even S.Jankovsky's) lead to quite an abstract and senseless interpretation of information, or demand a lengthy additional explanation and decoding.

Therefore, taking into account what was told above about the basic kinds of information used in the human society, we may in the following way formulate its combined definition including several constituents: *information is, first, data about the current situation, and among them: about conditions and changes of the environment, its separate objects and phenomena; secondly, the data formed and used for the organization and control of our actions; in the third, the data received and accumulated as knowledge; and, at last, the data and programs incorporated in human beings by the nature and ensuring their biological development and in a large extent, determining their behaviour (the genetic information).*

Thus, having arisen in the biosphere, information following the progress of mankind becomes the determining factor of its development. Intensive processes of informatization proceeding presently result finally in formation of the information society, as a new form of existence of mankind. At this society knowledge and intellect begin to render deciding influence not only on its own development, but also on the character of proceeding of the biosphere and geological processes, reaching further the stage of development named noosphere. Up to the present there is already a whole philosophical trend noospherizm. This is an optimistic philosophical theory because in it an accent is made on the development tendency of mankind. However noospherizm is being more and more definitely opposed by finalizm which representatives emphasize that during its development the mankind for the accumulation of the capital of knowledge as if pays and will pay with the exhaustion of resources of the planet and pollution of the environment. And finally that will lead it to degradation and destruction.

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