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ICT

Innovating for and by users

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Eugène Loos and
Bartolomeo Sapio

Information and Communication Technologies

COST Action 298

FINAL REPORT

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COST Action 298
'Participation in the BroadBand Society'

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IBBT - the acronym for Interdisciplinary institute for BroadBand Technology - is an independent research institute founded by the Flemish government in Belgium to stimulate ICT innovation. The IBBT team offers companies and organisations active support in research and development. It brings together companies, authorities, and non-profit organizations to join forces on research projects. Both technical and non-technical issues are addressed within each of these projects.

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Preface

The European Council in March 2008 called for creating the European Union's Fifth Freedom, the free movement of knowledge. This gives an additional push to the objective of realising a European Research Area (ERA), in which researchers, technologies and knowledge circulate freely.

It goes hand in hand with the ambition of offering affordable and secure access to 'broadband for all', while promoting an open internal market for the distribution of digital media and services. A European Research Area and a European broadband area are both indispensable for reaching the objectives of the Lisbon strategy: sustainable growth and jobs and a good quality of life. Just like we have a long way to go to cross national divides in research, we have a considerable way to go to combat different forms of digital divide in Europe.

Communication and information exchange are vital human activities. It should be natural for R&D and innovation on computer and communication sciences & technologies and broadband to go beyond pure technology-driven aspects. Many studies dealing with technology assessment and interdisciplinary research confirm that user-centric design is becoming increasingly important to ensure a high-level of acceptance and adoption of new technologies by the public at large. This determines to which extent technology is deployed and used, factor that determines by itself our future competitiveness. A region's competitiveness will increasingly depend not only on the technologies it develops, but also in how much these technologies are appropriated by its people.

But precisely because of its interdisciplinary nature, this field of research is still to a large degree under development. Initiatives that advance the interaction between engineering sciences and social sciences deserve special attention and support.

The COST network (European Cooperation in the field of Scientific and Technical Research) has a tradition of providing platforms for inter-disciplinary collaboration and scientific exchanges between researchers across Europe, from academia as wells as from industry. COST Action 298 on 'Participation in the Broadband Society' is a good example. Part of a larger portfolio of Actions focusing on eSociety, its objective is to produce new knowledge about users' creativity and to help encourage their participation in a broadband information society.

In particular, the research activities on 'Users as Innovators', aim to produce a range of insights concerning the Broadband Society and its future. They address the ways in which broadband either enables or constrains users' ability to develop innovative social practices. The scientists examine patterns of behaviour during diffusion, users' innovation and the ways users make choices to use or not use broadband technology, from which they attempt to derive frameworks and methods contributing to the development of guidelines and instruments for policy-maker and industry.

The present book, which presents a collection of inspiring research results on the integration of inter-disciplinary perspectives on the role of users in communication technology, results from a COST Action 298 conference in Moscow in 2007. That conference brought together engineering researchers, social scientists, policy-makers, industry representatives, technology and product developers, designers, community representatives and other stakeholders interested in computer and communication sciences and technologies (CCST).

Looking at the shifting roles of users in the ecosystem of research, development and innovation in broadband sciences and technologies, this book is a welcome publication. Economists and innovation theorists argue we are in the midst of the fifth techno-economic paradigm shift, this time based on CCST as key enabling technology. As CCST is getting increasingly intertwined in the everyday life of European citizens, a more holistic view is required. The book provides new insights in a general theoretical sense as well as in specific societal and economic aspects (like TV industry, publishing and health care), based on state-of-the-art academic and industry-driven CCST research all over the EU.

I hope this publication will incite many other researchers in CCST to get involved in a more user-centric perspective in their scientific work and to look beyond their own discipline. In doing so, they will help to put technological research into a broader European society perspective. After all, it is to make our society better that we engage in research.

Dr. Janez Potočnik
European Commissioner for Science and Research

Introduction

Over the past several years, a network of European researchers from telecommunication departments, universities and operators, together with independent consultants has collaborated at different points in time within the scope of successive COST actions – originally COST 248, then COST 269[1] and now COST 298[2]. These actions resulted in the publication of diverse reports and books, based on the work of the network members themselves and the contributions to conferences.

From May 23rd till May 25th 2007, Cost 298 organised a conference in Moscow entitled: 'The Good, the Bad and the Unexpected'. The main objective of this conference was to exchange knowledge on the creativity of users within the interdisciplinary field of Computer and Communication Sciences and Technologies (CCST) and their empowerment in a broadband information society.[3] The issues that were discussed included current theoretical frameworks, contemporary research projects, issues in and approaches to the design of ICTs, ways of analysing people's use and experience of these media technologies and potential social implications.

It has become increasingly clear that the development of information and communication technologies is not only unstoppable, it also follows unexpected roads. However, the conference confirmed that there are large differences in the adoption and use in different regions of the world, by different groups in societies, and in the types of devices that are predominantly used and the ways they are used.

Up till now, broadband technologies have resulted mainly from technological and institutional imperatives. The question is to what extent (potential) users have managed to find ways in which such technologies can be useful, meaningful, worthwhile and attractive. We certainly know from previous research that 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 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, or 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 - but therefore not unimportant - place in their lives. They may also be resisted or ignored. Whatever the strategies developers set out and the tactics users employ in relation to such innovations, we need to learn more about these socio-technological processes. These are the processes that are mutually shaped by technological pathways and social practices. Only by opening the 'black box' of broadband technologies in this way, can we hope to empower people further in their relationships to media technology and - through this - to increase the quality of their lives. The latter relates to the title of

[1] See <http://www.cost269.org> where various reports from both these early actions can be found. See also Haddon et al. (2005) and Loos et al. (2008), two volumes based on the final COST 269 conference which took place in Helsinki in September 2003.

[2] The work of COST 298 action can be found on <http://wwwcost298.org>.

[3] From the perspective of COST 298, 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, at all time, and by everybody.

the book: 'Innovating *for* and *by* user': insights on how to innovate *by* involving users more intensively in the design of technological innovations can lead to innovations that create more benefit *for* these users.

In this context, a number of carefully selected papers from the 'The Good, the Bad and the Unexpected' conference were reworked, that deal with the issue of innovations and the ways users (do not) fit them into their everyday lives. They are part of the COST 298 strand 'Users as Innovators'. This strand was more or less a follow-up of the strand with the same name in the Helsinki conference: 'The good, the bad and the Irrelevant' in 2003. While in the latter conference the focus was largely on design, here we centred more on the interaction between users and technology. The chasm between the design of technology and the actual use by individuals and user communities in diverse circumstances can be startling deep. Understanding the different ways which designers on the one hand, and users on the other, cope is extremely relevant, all the more so in the light of the finding that users often act unexpectedly from the perspective of the designers.

The book focuses on user participation and user experiences, both in the sphere of everyday life and in the sphere of professional innovation. The different chapters reflect on (innovating) users in current broadband society. For years, policy makers, industry people, media and technologists paint utopian or dystopian pictures of revolutionary changes in society that could be the result of the ICT revolution, indicated by Flichy (1995) as the technological 'imaginaire'. The suggestion there is that these changes would result into an easy-to-live-in, egalitarian world in which all people will benefit of the blessings of more and more advanced technology. The chapters in this book deliver a reality check on the current broadband society from a users' perspective. They look for explanations why this expected world is still way-off: not only the changes in adoption and use of the new technologies is slower than expected, it also seems that there is a reluctance by potential users, to change their habits and the ways they use technical artefacts to advance in the direction that is predicted.

This does not mean that nothing could be done to further the interest in broadband services, both by technologists and by policy makers. A better fit should be created between the possibilities offered by technology and the capabilities of the individuals that are supposed to make use of them. The chapters in this book provide insights into the realities of the users' worlds, thus offering a view on what could be done to guide the appropriation of the broadband devices and services of the present and the technologies of the future.

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CHAPTER 1

Everyday life: Domesticating the invisible

Maren Hartmann

The everyday

Close your eyes and think of daily routines – the way to work; the radio in the morning; the interaction with family members, friends and colleagues; the tiredness; the never-ending flow of things that need to be done; the supermarket around the corner. Or begin to think more concretely of the objects surrounding us: underground train stations, washing powder, radios and radio shows, warm coats, bread and butter, etc. All of these objects (and many others) are related to one particular concept: to the everyday. Many of them will come to mind as soon as the term 'everyday' is mentioned and no one would protest against their explanatory power for the concept of the everyday.[1]

But first and foremost these associations are pre-conceptual: they are our daily experiences. It is only because of dominant discourses of the everyday that we come to name them thus. Even on the next level of abstraction, the consensus seems inescapable (just as much as the everyday is described as inescapable). On this level of abstraction, the everyday is perceived as the mundane, the repetitious, as a routine – altogether a stark contrast to the extraordinary and desired – as well as to the new. The everyday routine instead tends to include the ever-same acquisition and preparation of food, the arrangement and cleaning of one's accommodation, the caring for family and friends and especially the world of work. Transport and basic consumption are also an important part of these associations, as is communication of many different sorts. These arrangements tend to be repeated so often, i.e. 'day to day', that they become invisible.

On the other hand, once we begin to look at media and technology studies and their take on the everyday, things begin to look different. The same applies to sociology. In both, the everyday is seen as the site for agency, for innovation. Many of the here presented chapter also follow this approach. The everyday use has for some time now been seen to provide interesting, otherwise not thought about innovations. Sometimes innovation is a bit more mundane, i.e. the user 'tames' the technologies, integrates them into the everyday. But this, too, is seen as active appropriation of media and technologies – as an act of agency and creation. The everyday is often described as *the* site for such processes. Both concepts, that of the everyday and that of appropriation, I want to have a further look at in this chapter.

The aim of this chapter then is to have a second look at established everyday life conceptualisations in relation to the idea of appropriation. Can we still use these theorisations to reinvigorate our understanding of what the everyday is (or can be)? And can these theorisations be useful in research, in increasing our understanding of the relationship between the everyday, media use and media appropriation? Plus, how do they relate to the media and technology studies approaches just mentioned? These are the questions driving the chapter. The two theorists used are Alfred Schütz (a core theorist of the everyday as such) and Michel de Certeau (for his stress on strategy &

[1] One common and definitely applicable protest is the idea of the cultural specificity of such associations.

tactics).[2] They, too, albeit in rather different ways, share the general tendency to see the everyday as a site of agency. Against this, I want to propose a more critical, differentiated view of the everyday of partially constraining construct. Instead of the rather widespread stress on innovation, I am asking how far 'conservation' is not the first issue in everyday life. To underline the point make, I will also refer to other contributions in this book. First, however, I will summarise some of the main arguments concerning the everyday of the authors in question.

Theories of the everyday

This invisible, but nonetheless dominant everyday life has for a long time only been at the margins of the social sciences (and other academic concerns). Despite repeated attempts to break this silence (and important theoretical developments in the field), the number of works that explicitly deal with everyday life remains small (in contrast at least to the dominance of the everyday in almost all lives). Media as well as technology studies have each developed their own strands of work around the everyday, but here, too, not much seems to have come out recently that deals explicitly with the concept of the everyday (instead they focus on the above-mentioned concept of user innovations in everyday life).[3] Just as the everyday itself, the concept is assumed to be understood by all and has thereby become somewhat invisible. As one rather active everyday life theorist, Ben Highmore, pointed out not too long ago: 'The everyday does not have a form of attention that is proper to it.' (2002: 161).

Not only does the everyday not receive the right form of attention, 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, if any definition is given at all, 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 then is faced with the challenge to find the expert and to find a way to extract 'everydayness' from them. The theorist of the everyday is faced with the challenge to step outside of the everyday in order to better understand it, to remove him- or herself from his or her own life. Plus the researcher needs to discover what 'everydayness' is actually about (cf. Highmore, 2002: 1). What the concept offers, on the other hand, is well summarised by Maria Bakardjieva (2005: 37), in that everyday life offers a focus on the human being (rather than technology or organisations, etc.) and as such includes diverse activities in many different settings.

The following theory-examples are particularly concerned with the relationship of the everyday to possible oppression that can also be found there. The everyday is seen by de Certeau as the site where this oppression can be challenged. 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. He, too, however,

[2] The selection is by far not exhaustive, i.e. there are also other theorists of the everyday (Henri Lefebvre, for example, or Walter Benjamin, or, more recently, Rob Shields or Ben Highmore). The selection was rather led by the idea that this particular combination relates well to much that is common in media and technology studies.

[3] There are notable exceptions, such as Maria Bakardjieva (2005).

sees the possibility for change based in the everyday. I will first introduce his 'basics' before introducing the other two in more detail.

Alfred Schütz' phenomenological approach

Alfred Schütz, an Austrian sociologist, is generally seen as one of the major theorists of phenomenology as well as of the everyday.[4] He is said to have made phenomenology available for the social sciences. Nonetheless, his work has not been as widely read and referred to as it probably should, although he keeps being quoted 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, 2004).

For Schütz the everyday lifeworld if 'the region of reality in which man [sic] can engage himself and which he can change while he operates in it' (Schütz and Luckmann, 1973: 3). He began by asking how the societal co-existence is possible without the knowledge of the subjective sense that others relate their own actions through. He assumed that all actors use specific methods in their everyday lives. These enable us to assume an intersubjectively shared sense. As a consequence, 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 the everyday agents' framework, the agent 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.[5]

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[4] 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, on the annexation of Austria by Germany, he and his family first fled to Paris, later on, in 1939, they emigrated to the USA. Despite his efforts to approach several well-known sociologists, his career took quite some time to take off. From 1943, he was a guest lecturer at the New School for Social Research in New York, but only in 1952, he got a professorship there. He died in 1959.

[5] 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. He also differentiates between 'Consociates' (who share the same time and space, i.e. access to each other's bodies), 'Contemporaries' (who only share the same time), and 'Predecessors' and 'Successors' (with whom one does not share the same time and whose bodies one cannot therefore access). 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

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 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.

With his overall approach, Schütz contributes to the theoretical foundation of our understanding of the lifeworld. He shows that this lifeworld consists of several different spheres and social types, which again leads to different ways of interaction (and meaning-creation). He thereby emphasises intersubjectivity and hence the centrality of communication. But he does provide little translation into more empirical approaches to the everyday.[6] Instead, he offers an ideal-typical (re-)construction.[7] Micheal de Certeau can also be seen to stay on the ideal-typical level, when he deals with the question of agency (of a specific sort) and the everyday. His view on *actions* that shape and change the everyday proposes yet another emphasis.

Michel de Certeau's resistance and agency

'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, an ethnographer of the everyday and more. His own movements in his life are mirrored by the terms he uses (they are 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, just like Schütz, to stress the importance of intersubjectivity. More importantly though, he 'judges' the everyday as potentially oppressive, but also exactly as (subtly) subversive and as *the* place for agency. The latter is the most quoted aspect of de Certeau's work.

For de Certeau 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 discipline is not adapted to, but is itself adopted into the everyday. However, this kind of resistance is not necessarily opposition to existing structures – it can be both active *and* passive:

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congruence of the systems of relevance and an idealisation concerning the possibility to be able to exchange one opinion for another.

[6] The ethnomethodologists attempted an empirical implementation of these theoretical approaches. This, however, goes beyond the scope of the current chapter.

[7] On the theoretical level, the sociology of the everyday, to which Schütz belongs, continues his work in focusing 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.

> ‘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 adds to the multiplicity and both preserves and challenges it. ‘Microinventions’ and the idea of ‘learning to make choices’ is one concept de Certeau uses to describe it. 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. In contrast to Schütz, it is clear in de Certeau what the agency is used for to work against. 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), i.e. something rather ‘small’ and ‘subtle’. 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, including Schütz, whose intersubjectivity is still interested in the subject as the starting point.

The assumed method to find the resistances is to find the marks that have been left. One is to archive the everyday and ‘everyday’ the archive (Highmore, 2002: 169) and therefore one should use a lot of different sources. However, one of the criticisms that has been raised about de Certeau’s analysis is that it is not necessarily grounded in a sociological analysis, but instead presents 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 or necessarily opposition). More than Schütz, de Certeau emphasises the structural elements that limit the everyday. Nonetheless, the resistance ultimately changes the everyday via the everyday – and potentially it changes more than just the everyday. But the changes are usually invisible, difficult to trace – at least on the surface.

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?

From everyday theory to practice?

A first step in using the theories above is to extend them. In a second step I will then criticise some of the underlying assumptions. While extension and critique are two different directions, I think that we need to live with the tension that the concepts are useful (and can therefore be extended), but nonetheless have potentially been interpreted and used in a fashion that was not differentiated enough.

Schütz has shown that 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. Therefore I want to introduce the idea of the *networked everyday*. This builds on, but extends, Barry Wellman and his colleagues' notion of networked individualism (Wellman et al., 2002). Wellman's concept underlines 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 rather increased. And some of the co-constructions are now taking place in mediated ways. Most of this, however, is invisible and needs to be uncovered. This is the emphasis on the everyday. I will return to the idea of the networked everyday in the criticism voiced below.

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. It can add a focus on the quality and nature of the links between different actors in such networks.

Additionally, we have seen that the everyday presents a power-struggle. There are strategies (we could call them capitalist, but this can be other forms of power structures just as well), 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). De Certeau's ideas underline that the 'top-down' strategies should not be forgotten when we research the nitty-gritty of microscopic everyday use of media. The resistances can only be thought when the top-down is also regarded. This then is simply a call not stay too much on the micro-social level. Another call that needs to be followed now is to see whether some of the basic assumptions have not potentially been interpreted too much from one position only.

Resistance towards everyday agency concepts?

Both of the above mentioned theorists stress, each in their own way, the importance of the everyday and the potential that the everyday has for offering agency. As also already mentioned, media and technology studies have taken this up (not always explicitly in terms of the theorists quoted above) and stressed for a long time how important the user (audience/public/…) is in determining the interpretation and use of media technologies and media content. Especially the everyday is still seen as a comfort zone, an area of independent and often surprising behaviours and actions, where most user innovation takes place.

In line with other theorisations of the interplay between (seemingly) opposing forces, i.e. especially between structure and agency as in the structuration theory, it appears appropriate to shift the emphasis a bit in the theorisation of the everyday. The shift implied is the emphasis of the interplay between structure and agency even in the everyday – and somewhat even in the individual him- or herself. It is an emphasis on the responsibility towards the construction of stability in the everyday. While the everyday – especially in its intersubjective nature – provides a basis for this stability, it

constantly needs to be renegotiated and renewed. And part of this responsibility leads to a form of conservatism that again potentially prevents innovative uses, new relations, etc. It might explain why many users are after all not partaking in the imagined fashion in this new media world. While this, too, could again be interpreted as resistance and agency, it at least poses the question of the everyday as the ground for innovative media uses.

It is not that the shift is a radically new thought. It is partly pre-given in Schütz (less so, but also, in de Certeau) and it is also partly present in media and technology studies approaches. However, I think it needs to be made more explicit.

Thus the domestication approach, for example, has often emphasised the conservative nature of many appropriation processes. This can still imply an adoption according to the user's desired principles, but it at least points to limitations of use – and hence also of agency. While exactly this point has often been criticised in the domestication approach (and rightly so – for it was taken for granted and other, more experimental uses were not looked at), it points to the everyday as a site of stability and closure that might be somewhat different to what the theorisations dealt with above suggest.

A recent study in Germany underlines this point. Users of online community platforms seem to want something much more mundane than what the 'web 2.0' world has on offer for them (Schultz, 2008). Instead of many new features, they would be very happy with a birthday-reminder-function. A good search tool and up-to-date news are desired, but blogs and newsfeeds are not on top of the users' wish-list. They tend to communicate with people they already know and are overall rather conservative in their uses. My own empirical work on young adults and new media some years ago also pointed in the same direction (Hartmann, 2004, 2005). Innovative uses can and do take place, but a lot of use is routinised, mundane, conservative.

Rather than agency, *responsibility* might be the term to stress here. This allows agency to remain, but to be shown to be less flexible – and potentially less enjoyable – than often assumed. Maybe we do, indeed, need to return to the human desire for structure, security, stability – for, indeed, the repetitious and mundane.

All of this is not meant to overemphasise just one side of the coin. Neither is it meant to deny exactly that possibility for innovation, for hacking, for unexpected behaviours and uses, i.e. for the new. These are, in fact, somewhat the more interesting and telling events, as several of the chapters in this book show. Take the formation of the WiFi community in Stefan Verhaegh's chapter, for example. Verhaegh shows how closely linked the technical infrastructure and the social network are. Active users are in fact innovating through the social-technical networks they are involved in. But here, too, we find a structuration phenomenon. But one can also read Verhaegh's chapter as underlining that behind such an innovation, we find social networking of a good old-fashioned type. As he shows, it is very similar to known patterns, but thanks to the technology, slightly different after all. Similarity can be found when softer social skills become important, when warm experts (see Stewart and Hyysalo in this book) or warm users are needed to actually make that initial link between technologies and people. This extends the aspect of responsibility towards others, underlining at the same time the intersubjective nature of meaning-creation.

Serge Proulx' distinction between use and the enrolment in social practice underlines the point raised here (see Proulx, in this book). Proulx claims that appropriation has several aspects, of which the actual use (and knowledge how to use) is

only one part. Next to the social practice, he adds innovation, community mediation and political representation as parts of the appropriation process. This is in contrast to other appropriation approaches that tend to be much more subject-centred (the social aspect is an important one as well, but more in terms of communication around media use, value patterns in households, etc.). It tends not to be social in the sense of an impact on the wider social sphere (at least not in this immediate sense). I do not want to follow Proulx in all aspects, but simply want to take his distinction between use and social practice as a guiding principle. Once in a while, it seems, use as such is seen to represent a form of appropriation. The integration in the everyday is when the medium becomes invisible and is used with ease. The innovation, however, takes place exactly in this second aspect of social practice. The above mentioned arguments around warm users and community innovation seem to support this argument. Uses embedded in other social actions have more of a potential to change (or at least challenge) existing patterns than simply uses.

Networked everyday 2.0

Not every kind of media use needs to be related social practices in the above-mentioned sense.[8] But if we continue to think around and look for innovation (and also participation in the broadband society), then social practices provide a basis – users need to be answerable for their actions. This related back to the idea of a *networked everyday*. 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. Methodologically, too, network analysis can be (and are) used to extend the focus beyond the individual or smaller structures. Methodological thinking in this area has recently seen interesting additions and new impulses, which could easily be integrated into future research in this field.

The reflexive nature of our current modernity has entered the sphere of the everyday life. Rather than taking the everyday lifeworld entirely for granted and thinking that our experiences therein are 'unproblematic until further notice' (Schütz and Luckmann, 1973: 4), we need to (unfortunately?) introduce some of the weight that agency brings with it – even in the everyday. Because the co-construction is one that is not pre-given, but made. And this needs to be re-made, communicated about constantly. The media play a vital role in this. The domestication approach showed this fairly early on in their concept of the moral economy (Silverstone, 1994: 45ff.). And they stressed the conservative nature of the process. What I have asked here is now whether we currently have a tension between widespread media and technology studies' assumptions about the innovations that users develop and the conservative (preservative) nature of people's desires. In an unstable world, the user might not want to innovate. However, the everyday appears to be slightly less unproblematic than assumed for a long time – both by everyday actors as well as by researchers.

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[8] Obviously, media use *is* a social practice, but I interpret social practice in this context to actually imply responsibility and potential consequences.

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CHAPTER 2

Confronting video-on-demand with television viewing practices

Wendy Van den Broeck, Jo Pierson and Bram Lievens

Introduction

With the digitisation of the traditional media, a whole range of new promises and expectations are also being engendered, the most traditional and popular mass medium, television, not excepted. Digital TV promises to give viewers control over broadcasting schedules, enabling them to adapt the medium to their own viewing habits and to interact with the offered content in various ways. In addition, the viewer is no longer bound to the television set, but can also watch TV programmes and other video content on different platforms and devices (e.g. computer, mobile phone, etc.).

In this chapter, we will explore the user aspects of video-on-demand (VOD) offered on two platforms: TV-set and computer. On-demand services promise the viewer the functionality of watching any content at any preferred time, thus creating extensive possibilities for time shifting. We will look into some of the promises made by VOD and attempt to contextualise these. Starting from the existing viewer practices, we will explore whether and how these new affordances may lead to concrete new user practices. The question we will try to answer in this chapter is: How do the new TV-related technologies, like VOD, interact with existing viewing practices?

To this end, we will identify a number of existing trends in the use of on-demand-video viewing and address some concrete future research issues and questions:

- What are the existing viewing practices?

- How can viewing practices be influenced by VOD services?

We will explore the possible impact on three specific areas: time, place within the home and content. The theoretical framework used to answer the main research question is largely based on the domestication theory (Silverstone and Haddon, 1996; Berker et al., 2005). On the empirical level, the research findings from an environmental scanning of existing knowledge of 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.). Next to the existing data on VOD, usage patterns are also being analysed.

Television viewing practices in everyday life

It is important to acknowledge that technologies or products are shaped within the everyday practices of people. 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' (Hand et al., 2005). Therefore a 'practice' is seen as a routine type of behaviour, which consists of several elements that are all interconnected to one other (e.g. like a way of cooking) (Reckwitz, 2002). This also refers to the idea of Oudshoorn and 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 and Pinch, 2003: 2).

On the meaning of TV for viewers and the existing viewing practices, many studies have been conducted (Lull, 1990; Silverstone, 1994; Bauwens, 2002). Television has long been the medium with the widest implementation in households and – moreover - 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 these (Silverstone, 1994).

Television dominance

Watching television is a time-consuming activity. An substantial part of our free time, is dedicated to watching television. When people in a European country, such as Belgium, 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, as half of their total free time or the time they can fill in with activities of their choice, is dedicated to watching TV. The average time spent on using new media, such as a personal computer and the Internet, still only accounts for a small proportion of the total amount of free time (4%). Average viewing times for Flemish households are about 178 minutes a day (APS, 2006). But despite these high viewing times, television is not regarded as a priority activity. If something else comes up, for example a visit from friends, people sacrifice their TV viewing (Bauwens, 2002). This is also described by Burton (2000: 144): 'Television is not life, although it's a part of our lives'.

Television experiences

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 focal point of sorts for families, and acting as a kind of timetable. This is also translated in the central place TV has in many living rooms. 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 and Stephenson, 2003). The television experience is determined by viewing behaviour, the social dimension and the scale of experience.

Viewing behaviour

The aspects of structure and routine also have 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 ourselves the luxury of doing nothing[1]. This means that people often first make themselves available to the medium, and only then start watching. This implies 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 and Bauwens, 2004: 83-84). This element of 'willingness' influences the viewing behaviour in such a way that once people have made themselves available to the medium, the content often does not matter anymore, to the extent that they even continue watching programmes they are not particularly satisfied with (Bauwens, 2002: 385-389).

Social dimension

Another important characteristic is that television is still regarded as a social activity and a family event**.** Although there may be multiple TV sets in our houses, there is often still one central TV set in the living room, on which programmes are watched together. People like watching together, although this does not automatically mean they talk about what they see (Bauwens, 2002).

Scale of experience

Watching television can be experienced on different levels. We noticed that television is often used as a secondary activity. More and more, TV accompanies us while we are performing other activities, like surfing the web with the TV on in the background, ironing in front of the TV, reading while the TV is on etc. We have therefore distinguished three levels (Van den Broeck et al., 2006; Lievens et al., 2007):

- TV in the front (primary): this is the most active form of watching television. No other activities are performed while watching.

- TV on the side (secondary): people are performing one or more 'primary' activities while also watching television.

- TV in the back (tertiary): in this setting, television is no more than a kind of wallpaper. There is no form of active watching at all.

Research on time-spending patterns in Flanders revealed that in 2004, TV was a side activity for an average period of 2 hours a week (TOR, 2004). Peters (2003) noted that younger people between the ages of 18-25 in particular tended to use TV as background or wallpaper. However, other studies have also noted the occurrence of this simultaneous use of television while conducting other activities. Lull (1990) describes television in this respect as an environmental resource, creating a flow of constant background noise. He views television as becoming a companion for accomplishing household chores and routines.

With these observations in mind, it is interesting to look at the affordances of video-on-demand. Affordances may be defined as the combination of 'perceived and

[1] Therefore viewers are often also referred to as 'couch potatoes'.

actual properties of the thing - primarily those fundamental properties that determine just how that thing could possibly be used' (Norman, 1988).[2] In the next part 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 summarised them.

Video-on-demand: new affordances?

The traditional viewing practices described above, could be influenced by new television add-ons. One such add-ons is video-on-demand. It is important to recognise that this service is not only linked to television as such, but also to other types of platform such as, e.g., the computer.

What is video-on-demand?

As a service, video-on-demand has existed since the nineties (Ling, 1999). The term refers to a technique that offers viewers to some extent the possibility of watching what they want, when they want to. This enables people to 'time-shift', or to free themselves from the existing broadcasting schedule. VOD also offers the viewer typical video recorder (VCR) related functionalities such as pausing, fast forward, rewind etc. in real time (Rajapakshe and Quek, 1995). The core functionality of video-on-demand comprises various different types of services: video-on-demand (VOD), near video-on-demand (nVOD), personal video recorder (PVR) and related to the latter, the electronic program guide (EPG).

Near video-on-demand (NVOD) is a video technique that broadcasts multiple copies of a program at short time intervals (10-20 minutes), giving viewers the opportunity to join in every 10-20 minutes. This is a typical pay-per-view service in which people pay per program they watch.

The personal video recorder or PVR is a device with a hard disk and is mostly linked to an electronic program guide (EPG). In this way, users are enabled to simply select the programmes they want to record from the EPG (one or all episodes). Users can also look for specific content to record, e.g. all movies with Richard Gere. The PVR also makes it possible to pause live –TV (referred to as 'flexview' or flexible viewing). Since the implementation of interactive digital television these PVRs tend to be integrated in set-topboxes, which leads 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 within limits, depending on the system.

Video-on-demand's possible interaction with existing viewing practices

Traditional broadcast television is determined by three dimensions: time, place and content. A certain type of content could only be watched at a certain time and place. With VOD, this interrelation between these dimensions disappears. Therefore VOD could, intrinsically speaking, have a great impact on the viewing patterns of people, as it will allow us to manage both time spent on watching television and the content we watch. It moreover, enables video content to be watched on other screens (e.g. the PC screen), which could significantly affect the location of the TV set in the house even to

[2] See also Gibson (1977), Newman (2001) and Pierson et al. (2006).

the extent that they become completely independent from each other. In that case, any type of content could be watched at any given time at any given place. In the next paragraphs, we will elaborate on these three specific elements.

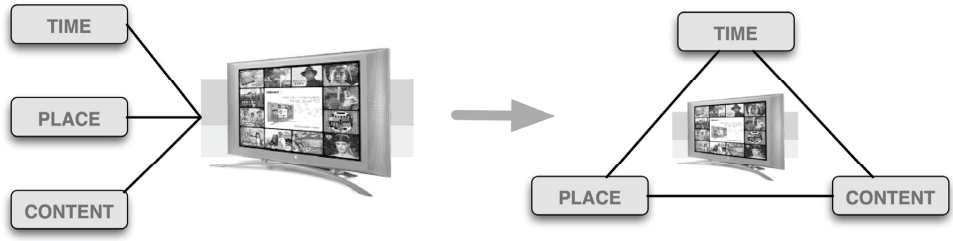

Figure 2.1 : time, place and content can become independent entities

Time dimension

Video-on-demand entails the promise of becoming 'masters of our own time' (Van den Broeck et al., 2004), by offering the possibility to manage our own time. People can use VOD services whenever they want, without the constraints of fixed broadcasting time schedules. One of the ideas is that by offering users more flexibility in organising their lives, they may be able to save time (Haddon, 2001). As there are only 24 hours a day, time is probably the scarcest resource for households (Punie, 2000; Hamill, 2003) and our time management is the result of a constant balancing between different categories: commitments, time off, social participation, time on the road and waiting (TOR, 2004).

The structural aspect of TV-viewing implicitly assumes that people will not be eager to save time by watching only the programmes they want to see, on-demand. The idea that people will save time using VOD services, is based on the hypothesis 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 programs, thus 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).

The time-dimension was challenged for the first time with the introduction of the video cassette recorder (VCR). Now, with the introduction of the personal video recorder in the set-up box, this is once again a subject of discussion. We briefly discuss both technologies.

The VCR

Specific for video-on-demand, is that its affordances are not new as they are related to the VCR. Existing research on the usage of the VCR, enables us to explore both time and 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: 316). In other words, viewers could gain control over viewing time and choice, as they could watch more selectively. It was expected 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, but also that viewers would be able to 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 content that was broadcast at inconvenient hours (Van den Bulck, 1999).

However, when the actual usage was examined, it was found that neither time shifting nor selectivity occurred to the degree anticipated. Research 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 lesser 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 all this is to be found in the user practice. First, the only decision that people make is whether or not they want to watch TV. Secondly, linked to the scale of experience, 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, for example, is also used to reduce viewing conflicts, e.g. for recording a soap and watching it later on, because other household members are not interested (Gauntlett and Hill, 1999). Although the VCR is mainly a time-shifting device, it has had 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 remains a channel they only use sporadically (Van den Bulck, 1999).

The PVR (personal video recorder)

The promises made by the VCR in the early eighties are very similar to those that are made today by personal video recorders (PVR) and on-demand video viewing. An important question here is whether this 'new' viewer autonomy will, in fact, lead to new viewing practices, or whether the experience with VCR usage will prove a good prediction of the use of video-on-demand and PVRs?

The PVR offers the same functionalities of time-shifting as the VCR, but the combination with an electronic program guide (EPG) offers an important usability improvement. 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 to two existing technologies, their TV set and their VCR (Ling, 1999).

Other research on the use of hard disk recorders or PVRs for time shifting, showed that[3]:

- The use of these types of devices is limited in relation to the total viewing time (only 7-8% in the Netherlands, and 13% in the UK; (SPOT, 2006)).

[3] See Van den Broeck et al. (2004) and 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.

Our own research has shown that people do make use of the opportunity to break free from the traditional TV system and to fit the incoming flow of content to their own needs (Van den Broeck et al, 2004). 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 advantage of this possibility will be used with abandon. 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. Instead of reorganising their viewing evening autonomously, they simply postponed prime time programmes to later on in the evening, when they had the time to watch them (e-VRT, 2003; Van den Broeck et al., 2004).

The findings above illustrate that currently, VOD and time-shifting are not really used to reduce the actual viewing times.

Content dimension

Another technical promise of VOD is that it enables a more personalised viewing behaviour. People will be able to adapt the existing broadcasting schedule to their own needs, choosing to view only those specific programmes they truly prefer. The available content is promised to be unlimited, making personal TV schedules feasible for the first time. Subsequently, video-on-demand can even make traditional broadcasting companies redundant 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, the increasing convergence as well as the 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. Technologies like Windows Media Centre and Apple TV try to link these two different platforms, thus enabling convergence.

Content selection

Important to estimate the impact of this new content dimension is the way people select their TV-programmes. The analysis of our existing viewing practices 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 best programmes. However, this does not mean people never select programmes or are not interested in watching on-demand content.

Taylor and Harper (2003), distinguished three periods of television viewing, each with 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', i.e., to switch off from school or work, to start the process of relaxing. Taylor and

Harper found this to be a highly disengaged way of viewing. Programmes tended to be selected at random, generally by surfing from channel to channel. Little or no use of program guides is made during this period. The channel surfing feels effortless and requires little thought.

(2) Mid-evening viewing: This period often runs through dinner and lasts until 8.30-9.00 pm. This is what is typically called the prime-time period. In this period, there is planned viewing of specific programmes and therefore the level of 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.
(3) Later-evening viewing: This type of viewing takes place when all the daily chores are completed, lasts until 11.00 or 11.30 pm and 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 particularly popular. In this phase, program guides are often used for short-term planning of the 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 to whether people just watch TV (according to daily routines and patterns, e.g. first the news and then a soap opera) or actively select programmes. This is also linked to the scales of experience (see above) 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 noted (Van den Bulck, 1999):

- Viewers may watch 'more of the same', e.g. they are watching action movie A and recording action movie B at the same time.

- Viewers could also buy, rent or record content that is not shown on television or that is not available in their normal viewing hours. It is only in this second case that VCR use leads to diversification.

- Viewers may also simply rearrange the broadcasting schedule to make viewing more convenient or to eliminate programming conflicts. In that case, the viewing diet changes little, or not at all.

- The number of genres correlates with the amount of time that people watch television. The more viewers watch television, the higher the number of genres they watch. However, for heavy viewers, the opposite holds.

Content experience
Another important content-related aspect, regarding 'experience' and the social dimension, is that unlike watching television, watching video is perceived as an event in 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. 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 paying for movies (video rental, movie theatre), but not for episodes of TV series (Van den Broeck, 2006). However, the first figures on VOD consumption in Flanders, show that people are willing to pay for episodes of popular soaps and TV series in two instances: when they missed the original broadcast stream, or when they want to watch the next episode in preview, before it is actually broadcast. In the top ten of on-demand programs, nine out of ten titles are popular soaps or series.[4] This endorses the idea that an extensive on-demand offering does not necessarily lead to a diversification of the viewing diet, but instead that people actually prefer 'more of the same' (Van den Broeck et al., 2004).

Internet: the new challenge

The Internet could be perceived as the absolute video-on-demand system. It gives the users complete control over the three basic dimensions of VOD (time, place and content) as mentioned above. Furthermore, the line between television and computer is starting to blur. Television sets are already being used as computers and vice versa. In addition, we also noticed a change in time-consuming activities, especially among youngsters, who are using the Internet more often (TOR, 2004). Finally, we are also witnessing the evolution towards a more multi-tasking context, where a combination of activities is performed at the same time, e.g. people working on their computer while making phone-calls and watching television.

As online video, or watching video via the computer, has become common practice over the past few years, this has developed into a real foe of traditional television. In the US, the majority of the online population (69%) already watched online video (OPA, 2005). The majority of online viewers are male, and the age group between 35-54 accounts for 45% of all online video viewing.

Yet 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, 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, 2006).

But the Internet also has another major challenge in terms of content: user generated content. User generated content is a relatively new evolution and is strongly enabled by numerous Web 2.0 applications and services, such as YouTube, Dailymotion, Joost. Each day more than 100 million movies of various different genres are being watched

[4] *De Morgen*, 31/01/08.

via YouTube only. As within most online communities, for these video sites too, the Nielsen principle of 1% of users contributing a lot, 9% contributing a little and 90% only consume content has proven valid (Markus and Hannu, 2006; Nielsen, 2006).

An important question is how this user generated content will evolve in the future, and the place it will take in existing viewing patterns.

Place dimension

The final dimension, which on-demand services can impact, is that of place. For a long time, television occupied a prominent place in the living room, forming 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 both in public and in private spaces, including children's bedrooms, parents' bedrooms, hobby rooms, and even kitchens and bathrooms (Lievens et al., 2007). Flemish research on the use of television in the bedrooms, has shown that 30% of the population has a TV-set in the bedroom. This means that our bedroom has a new function, becoming a place to relax and escape from the stress of everyday life.[5] This is also related to changes in experience, as well as to the social dimension. However, the best equipped TV-set is still placed in the living room and most programmes are still being watched here (Bauwens, 2002).

In addition, also other screens in the house (e.g. computer screens), can and are being used to watch video content.

It is also important to recognise that the practice of watching television is also being transferred outside the home. More than traditional television sets, mobile television is emphasising on interactivity, including video-on-demand. Research has already showed that this mobile evolution does not necessarily mean that this is in addition to watching television on a regular TV-set. One of the places where mobile television is being used is, perhaps surprisingly, in the home. (Södergard, 2003) Next to this, because of the intrinsic capacities of mobile television, new viewing patterns are starting to emerge. The question here is, to what extent this will influence traditional or existing viewing patterns?

Conclusion

When looking at the existing user practice of TV-viewing, two elements seem to be of importance: the dominance of television and the television experience. The first element refers to the fact that television is domesticated in such a way that it has become a natural element in our daily life practices, not to say a dominant part in many households. The second element refers to how people experience traditional television. This is influenced by their viewing behaviour, the social dimension and the scale of experience of TV-viewing. All of these are being challenged by the opportunities new technologies offer.

[5] Based on market research conducted by Herman Konings from the Belgian trendwatching company nXt (www.nXt.com).

If video-on-demand - and with this, new kinds of audiovisual content - are to fit within these everyday viewing patterns, it must interact with those two elements, taking into account the three major dimensions on which VOD has an impact: time, content and place. Video-on-demand, after all, enables people to see what they want, where they want, when they want.

Our research has indicated that there are some very specific elements of importance with regard to the domestication of VOD. First, on-demand services offer people the opportunity to watch the content they want to watch, in a relative simple manner. A major advantage of the on-demand system is that it relates quite well to something people already know (VCR) and, more importantly, with which they have already had 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 wish to, but this does not mean that they will use it intensively. The availability of choice is more important than the actual usage of this option. The convenience, the comfort and perhaps even the social aspect of TV viewing still render live-TV popular. As in other research on the use of new technology, this is linked to the idea that old habits die hard. People don't change their habits overnight. Instead, there is a gradual shift towards new user practices, as a result of 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 lose control. Therefore there is (still) an important role 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 need to be identified. Further research should therefore focus, in more detail, on the gradual shift in user practices influenced by not only the convergence of media, but subsequently also the convergence of the accompanied affordances.

Acknowledgements

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CHAPTER 3

Mobile television: A hype or a real consumer need?

Agnes Urban

Introduction

Mobile media are not a new phenomenon. Consumers have always searched for ways to kill time while en route, and various products and devices have been pressed into service for this purpose (printed media, portable radio, MP3, game consoles, etc.). Television, however, has been the conspicuous exception to the mobility trend. The problem is not a technological one - television services have already arrived for mobile phones - but the market potential is uncertain.

Numerous different technologies are available, and it is now up to the mobile operators to try to find the business models that best fit these technologies. The mobile television supply chain involves market players from different markets (e.g. content production, broadcasting, mobile market). The manner and extent of vertical integration depends on the ability of these companies to exploit their core competences.

The deeper question is, however, whether consumers actually need mobile television services or whether these are merely new revenue-generating services that are being pushed by the operators. Pilot projects carried out in this area had yielded a number of very surprising results. This chapter aims to provide an overview of the potential market demand for mobile television services. Although the service is a new one, some speculative predictions can be made based on the current media consumption patterns. After all, while business models and technological background are both crucial, the real questions are who will be watching television on mobile devices, when, where and - most importantly - what genres or programs will prove to be the most popular.

Consumers often expect a certain degree of mobility from the media products, which, obviously, is supplied by newspapers and other printed media. However, radios and other electronic devices can offer virtually the same portability benefit. This is less evident when it comes to television. Until only a few years ago, mobile television was far beyond the realm of possibility, something heavy-user television fans could only dream of,. However, with the diffusion of third generation mobile services (e.g. UMTS) and with the introduction of mobile broadcasting technologies, mobile television is not a no longer a futuristic vision.

Business models and pricing strategies

Mobile television services can be offered via a variety of different technologies. The first mobile television services became available for 3G systems, which feature bandwidths high enough even for video content. Based on unicast technology, these are highly personalised services: subscribers can watch any kind of content at any time, but the prices are high. This kind of point-to-point communication is costly, as, in some cases, the exact same content is sent to numerous phones in the very same cell, making

it impossible for economies of scale to be realised in this case, and rendering capacity planning problematic.

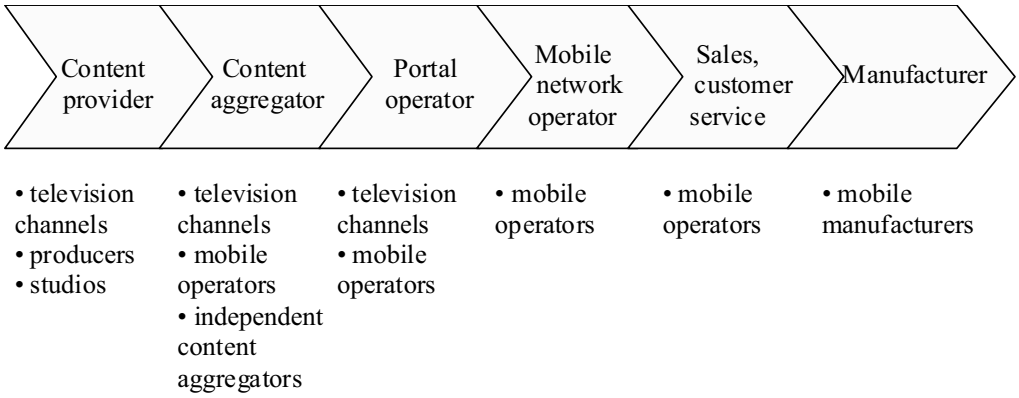

Figure 3.1: Supply chain of mobile television services offered on mobile networks

Mobile operators have a key role on this platform, even if they lack the core competence to provide content. Irreplaceable in their function as network operator, their sales/customers services are crucial, as they use the frequencies, have direct relationship with the consumers and handle the billing system. Operating a portal is another possibility (an example is Vodafone Live!, a content portal operated by the Vodafone). In this model, mobile operators are optimally positioned to play the central role in the supply chain; the level of vertical integration depends on its market power and corporate strategy.

The situation is different for mobile services offered on broadcasting networks. 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 standard. Here, the role of the mobile operator is less vital, since the mobile network itself is not essential to the core service. Moreover, both the sales and billing functions are unnecessary if the business model is built on free-to-air (FTA) services. Exactly which supply chain player will end up with a key role on the market in this case is not yet clear.

This technology is relatively new and the potential business models are uncertain. In the *content provider centric* business model, the competition for the valuable rights is based on the concept of 'content is king'. However, the lack of customer service and billing system can cause difficulties for the content provider.

In the *content aggregator centric business model*, the content provider is likely to be integrated with the content aggregator, although here, again, the lack of direct customer relationship can be problematic. If the operator of another platform (e.g. a cable operator) enters the mobile business and takes over part of the content aggregation function, the billing problem can be solved.

The *multiplex operator centric business model* is perhaps the most uncertain, since the whole long-term future of the digital television market is relatively unpredictable. 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), the role of the multiplex operator can be crucial, especially in developing a customer relationship system.

A *network operator centric business model* is also possible. In this case, the broadcasting company might operate the terrestrial network, but it will lack a customer service. Learning from the experiences of digital terrestrial television (DVB-T), the network operator may gain a role in the multiplex operation, which would strengthen 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 might obtain a foothold. The same holds for paid services, since the conditional access system should be operated by the mobile operator.

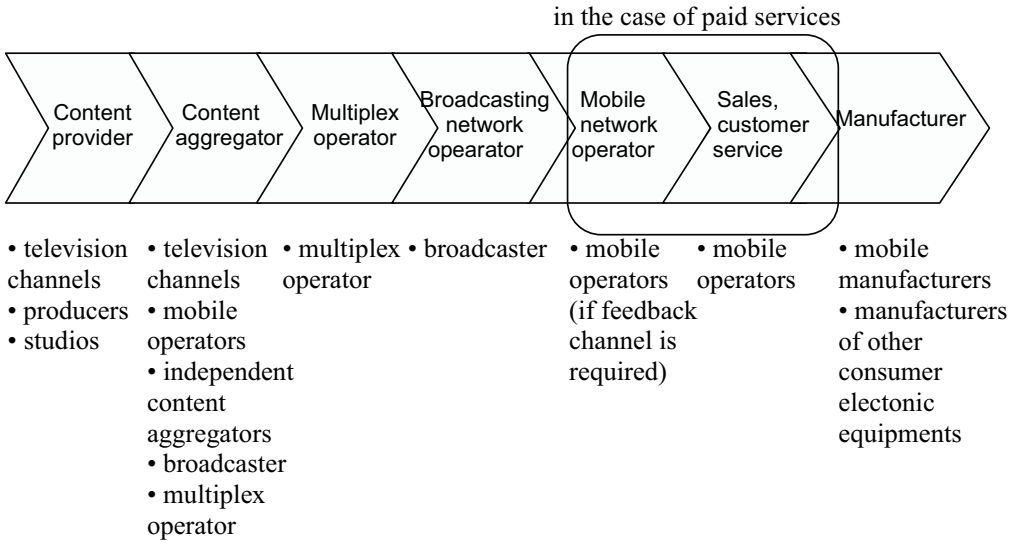

Figure 3.2: Supply chain of mobile television services offered on broadcasting networks (DVB-H)

The other uncertain element in broadcasting-based mobile television is the end-device. Surprisingly, even the self-evident role of mobile phones can be questioned. Other devices (e.g. PDAs, enhanced MP3 players, game consoles) can replace the phones and offer a better viewing experience for the users. The fact that phones have become part of daily life, with many users going nowhere without them, affords these devices a definite competitive advantage. However, the small screen is a disadvantage, yet enlarging mobile phone displays solely for mobile television purposes is hardly an option. (Trefzger, 2005). 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 taught several lessons over the past decade. According to Rogers (1986), the communication industry is characterised 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 to both 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 in television shows. 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 studies are based on this assumption. Evidently, this changes the basic question in diffusion research: 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 though some of the contents may target only niche markets. Whether or not this mass market exists remains, as yet, unclear. And the main question is whether consumer demand for mobile television services is really there, or whether this is merely a hype with a business failure at the end.

The basic platform for mobile television services is, practically speaking, the strategic decision of market players. Obviously, mobile operators want to hold a key position in the supply chain based on the exploitation of their consumer relationships. This service can increase the ARPU (average revenue per user) and opens the market potential of media industries. For the broadcasting companies, this means a new distribution channel for their content, as well as a possible means to gain a strategic role in the service provision. 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 on mobile television, although some national regulatory authorities have started investigating this field.

An attractive pricing model and price level is crucial to the success of mobile television. Generally speaking, the basic pricing models are the same as in the media business (Trefzger, 2005):

- pay-per-view (time based, volume based, event based);
- subscription;
- one time fee;
- free models.

Subscriptions are expected to offer the most popular pricing model, after the free services. The experiences of the pilot projects also support this assumption (Holland, 2006; TNS Infratest, 2006). On the infocommunications market, flat-rate pricing proved to be most successful (cable television, broadband internet, mobile services), with usage-based models lagging far behind.

A combination of different models is also possible. Subscription-based pricing

supplemented with pay-per-view events can be acceptable to consumers and profitable for operators. However, consumers are only interested in paying extra for premium content, such as offered by some sports events (e.g. premium soccer on the European market), which could therefore be suitable for this kind of pricing.

The FTA services can be also favourable for users, with in that case, a challenge being the financial return of the service. It is uncertain whether the content to be provided can be financed by the advertisers. A critical mass is essential in that case. The problem is purely chicken or egg: without a mass audience, the market players will not finance the development of free content, but without content, the service holds no appeal for consumers.

The one-time fee is the least common (e.g. American digital satellite radios offer life-long subscription for a one-time fee), but a premium price built into the end-device is also possible.

Consumption of new media services

Analysis of new media services is an emerging field in the media economics literature. New media are the totality of those mass communication devices and services which allow the interactivity of services and the personalisation of media content (Urban, 2004). 3G technology can maximally fulfil this requirement. It is less evident whether broadcasting technologies can suffice to an equal extent,, even if a mobile network can be used for feedback.

To evaluate market demand for the mobile television services, we must first identify a number of crucial points in the environment of mobile television. It is a brand new service - but not one without precedent. Experience gained in the media and communications market may help 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 is whether 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 evidence that combining functions in a single device is necessarily attractive for consumers has not yet been provided.

Goldhammer (2006) compares the highly converged devices to a Swiss army knife. It can be really practical outdoors, but at home we prefer to use specific knives for different purposes, and to 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 to converging the functions, the mobile phone can remain a device primary for personal communication. It is not at all clear whether users wish 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 type of content desired by the mass audience. For a long time, the ‘content is king” concept has prevailed in media economics literature. The concept of Odlyzko (2001) questions the hegemony of professional content and emphasises importance of connectivity. User-generated content

(UGC) became a buzzword over the past few 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, providing civil content can be especially important in some breaking news situations (terror attack, accident, etc). The mobile phone owners immediately become correspondents, as has actually happened on Internet portals several times during the past years. Its real technological environment is 3G, as the viability of UGC is less evident in the broadcasting model. From this point of view, the development of mobile Internet can be threat to the mobile television market.

The UGC phenomenon can also have an impact 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. This can stimulate interactivity and personalisation in the business development of mobile broadcasting (Tadayoni-Henten, 2006), and work to the advantage of the 3G networks, with their capability of providing personalised content, against the mobile television services offered on broadcasting networks.

We have to recognise that next to mobility, time-shifting is also a trend in media consumption. Users have a natural desire to consume media services where and when they want. The change of 'technological push' models into 'market pull' models in communication industries reflect this development. Nowadays, free time is limited and consumers are impatient to kill time when they would otherwise be kicking their heels while waiting for something, or having to spend time in an activity without doing anything (waiting in a queue, sitting on a bus). No doubt, mobile television can be suitable for this purpose.

The highly personalised mobile television services can theoretically fulfil the requirements of the consumers, but several practical questions arise. No one knows the exact consumer needs concerning the content and quality issues, and the crucial question remains: how much are users willing to pay for the services?

Consumers' acceptance of mobile television services

Even most brilliant of technologies and innovative business models will 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 phones, the introduction of the service involves a business risk. Concerning the potential market demand for the service, a few basic questions need to be asked:

- Which kind of content is most appealing to 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 watching mobile television?

There are only a few commercial mobile television services (at least with broadcasting technologies). We can obtain an impression of 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 a study of A.T. Kearney conducted in twenty-one countries, news and sports programmes are the most popular. Younger age groups seem to prefer music content. The different preferences in the age groups are illustrated in Figure 3.3.

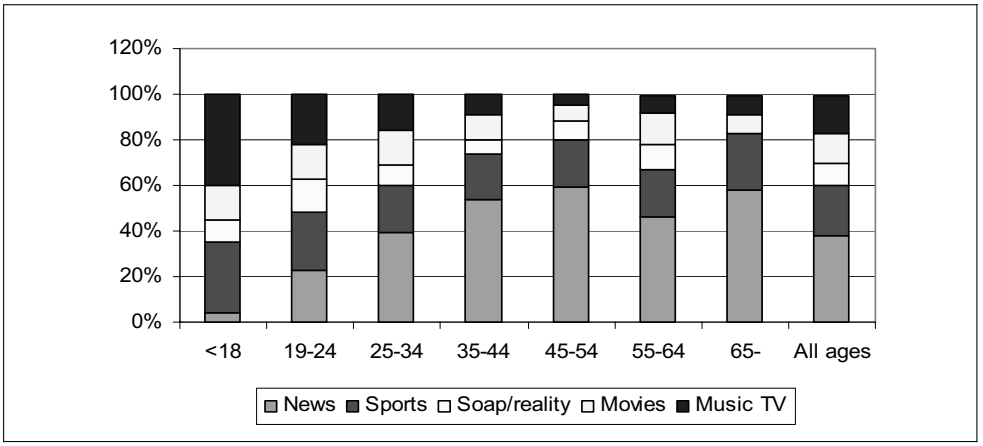

Figure 3.3: "What type of TV programmes would you be most interested in?", by age[1]

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 timed to the World Cup. The triumph of Italian national team was an exceptional stroke of luck for the service provider, and 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.[2]

Due to the relatively small size of the display and also because of the short and fragmented viewing situations, movies - the other premium content - will probably be less popular on mobile television platforms. In Korea and China, special made-for-mobile films were produced, which became a commercial success. They are different from traditional movies, in that the editing is more fragmented and unconventional camera techniques are used (Orgad, 2006).

Whether mobile television will stimulate specialised content development, or whether the content developed for traditional television will be suitable for mobile usage remains to be seen. 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 provided as part of the 3G services without any significant success.

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[1] Source: A.T. Kearney - University of Cambridge (2005).

[2] At the end of 2006, the customer base was 400,000, by May 2007 this had increased to 600,000. (Relevant information about the 3 Italia mobile television service are available at <http://www.dvb-h.org/Services/services-Italy-3Italia.htm>.

Willingness to pay

The return on investment in the development of programmes is extremely uncertain. The willingness of users to pay is relatively low, as the different research results illustrate in Figure 3.4. These sums may change as more and more content will be available on the mobile platform and users consider the service as the part of everyday life.

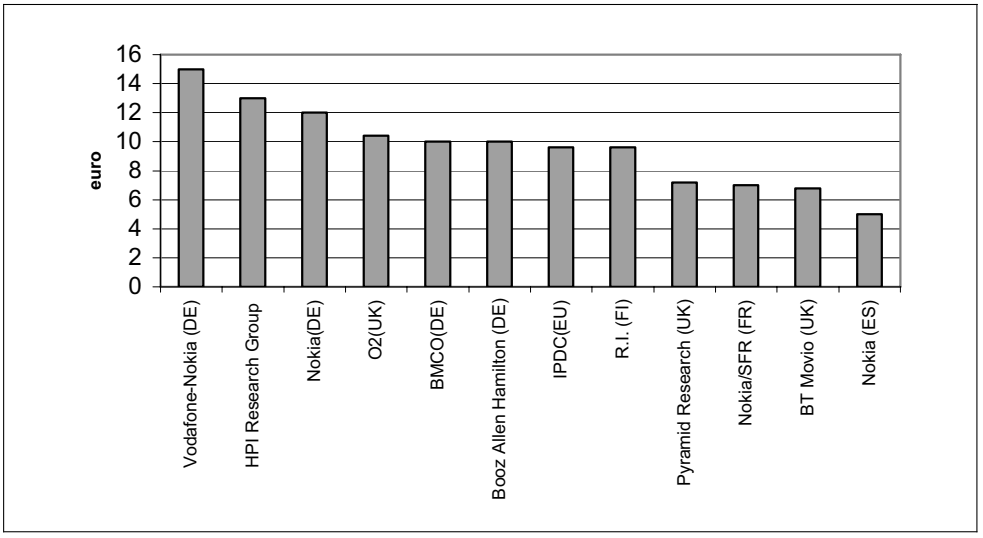

Figure 3.4: Willingness to pay (monthly in euros) based on different research results[3]

Premium content can have high revenue generating potential. Countries having popular sport content and a high demand for this content (e.g. soccer in UK, Italy, Germany, Spain) are in favourable situation. The lack of domestic premium sport content will hinder several smaller countries, as this will affect both the ARPU and the number of subscribers.

The question of the adult content is also very tricky, as the mobile phone may well not be the most suitable device for viewing this type of content. 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 the revenue-generating potential of adult content. Unfortunately, it is not an easily researchable area. Neither do the pilot projects have much to say on the matter. Orgad (2006) points out that ca. 30% of video content viewed on mobile device outside the U.S. is pornography. What is certain is that this must be taken into consideration if some idea about the mobile television market is to be gained.

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

[3] Source: BCE (2006).

during commuting or at work, but also at home. It means that mobile television can replace traditional television, or at least function as a secondary set in the household.

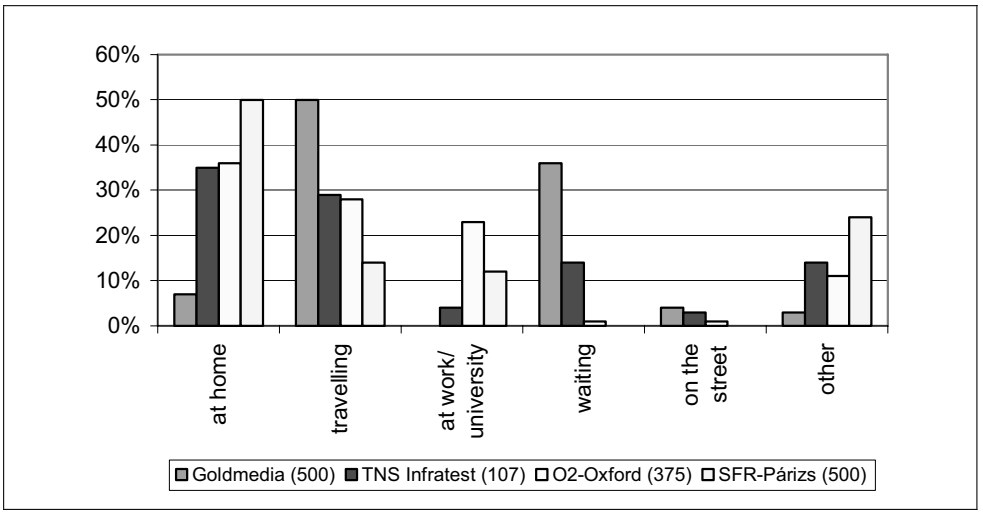

Figure 3.5: "Where do you use the service most often?" [4]

The relatively high proportion of the home viewing is somehow surprising. At first sight, the core competence of mobile television is its immediacy and flexibility. Consumers access the desired content where and when they want and they do not miss the breaking news. The entertainment component can be also important when people are unoccupied or 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 is that a mobile device can create a wholly private environment in the household (e.g. in the case of pornographic content, it can be an evident need). Portability, too, may be a useful feature, even inside the house, making television content available in the rooms where otherwise this was lacking (e.g. kitchen or bath). However, these are only speculations; consumer research should aim to discover the motivations behind home-viewing of mobile television.

Time devoted to mobile television

The market potential for mobile television very much depends on the time devoted to viewing. Initial results from pilot projects have indicated that participants spent relatively little time on mobile television viewing.

[4] Source: RTR (2006), TNS Infratest (2006), Mason (2006), LesMobiles.com (2006).

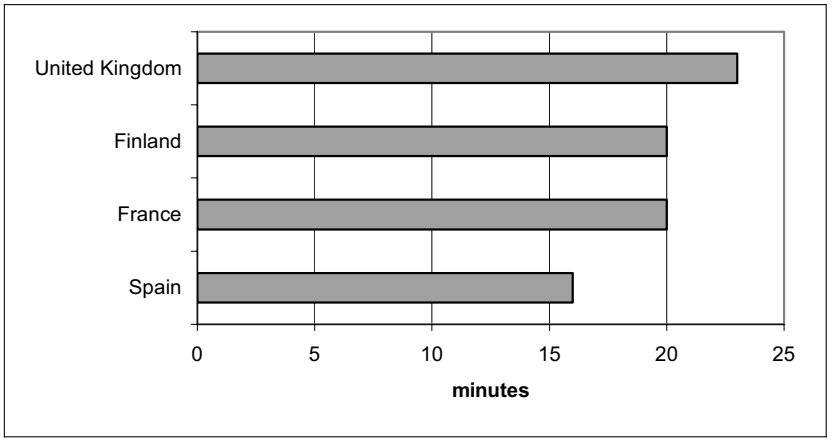

Figure 3.6: Average daily viewing of mobile television services (based on different pilot projects)[5]

The results of the latest pilot project, just finished in Stockholm have yielded similar results. Some 62% of the participants spent 1-25 minutes per day watching mobile television, mainly in the morning and evening (Bergdahl, 2007). The expectation that mobile television would reshape the television prime time, overtaking daytime viewing in higher importance has failed to come to pass.

Generally, the pilot projects have not given the potential investors cause for much optimism. There is a demand for mobile television services in certain situations and for a certain type of content, but this demand is limited. The return on content development can be risky, as the programmes originally developed for traditional television tend to be less fun to watch on mobile displays.

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 derive from surveys and pilot projects. The market players are faced with a dilemma. On the one hand, 3G services are relatively well known and the possible business model is more or less clear. However, the mobile television cannot be said to be really popular. A possible reason might be the high prices, which are a natural consequence of the high cost. The economies of scale hardly prevail in this case, because of technological reasons. Due to the point-to-point connection, the costs actually increase as the number of users grows.

On the other hand, opting for broadcasting technologies is also a risk. The business models are not clear and the role of the mobile operator is uncertain. Broadcasting technologies involve higher investment costs (a broadcasting network has to be built out), yet the capacity planning is less problematic. On the other hand, as media consumption is becoming more and more interactive and personalised, the one-way broadcasting technologies are likely to be less preferred by the consumers. It will be a challenge for market players to integrate the advantages of the two technologies

[5] Source: <http://www.dvb-h.org>.

and to offer an attractive service to the consumers at a competitive price.

The behaviour of the consumers is also up to speculation. Technological development is proceeding much faster than consumer habits are changing. In the infocommunications sector, the pull model has suppressed the push models, but overall, the technological possibilities influence market development to a major degree. The competition for the consumers' free time and money has grown more and more intense. Mobile television can be a competitive medium, since it can serve as a means to kill time while waiting, commuting, etc. Rationality, however, is not enough for the market success. Emotional aspects, such as the new viewing environment (e.g. on the street or on bus) or even 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 cannibalise the mobile television market with the introduction of mobile internet services. If consumers can access the internet using their mobile phone, they can get all the information and entertainment they want: no need for traditional television content. Of course, other technologies and other devices can offer a challenge to the mobile television market, as well. 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 failed to back up this assumption with proof. This means that probably a different kind of program development strategy is required than was hitherto assumed. The broadcasters have been searching for a killer application in interactive television for many years, and now, mobile operators are apparently trying to do the same. Van Dijk and de Vos (2001) compared the search for interactive television to the quest for the Holy Grail. Maybe the mobile television market players will prove more successful in finding the killer application.

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CHAPTER 4

Cluster analysis of internet users: A longitudinal examination

Karianne Vermaas and Lidwien van de Wijngaert

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 grandchildren. Yet another person may go online to send e-mails and find information, while others use the Internet in a professional capacity. Many different kinds of people use the Internet, for a variety of things. The question is, however, what kind of people use what kinds of Internet applications? Can groups of Internet users be recognised that are for example typical 'gamers' or 'serious information seekers'? And what type of people are they?

The objectives of this study are firstly 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 makes this information even more valuable. Insight into these patterns enables us 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 undergo.

Theoretical background and research questions

Although we consider this research as explorative, it clearly has a theoretical background. 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 (Rosenberg, 1982; Johnson and Rice, 1987; Leonard-Barton, 1988; Kline and Pinch, 1996). People with different lifestyles are likely to show different internet usage patterns. But also per individual, usage patterns can change over time. People constantly evaluate how an innovation or technology fits within their daily routine. The use of technology can change because of changes in daily routines and activities, but also the use of the technology itself can cause changes in daily routines (mutual shaping).

During the implementation phase, the functions of a technology may change as usage patterns and experiences change. This process can be divided into several phases (Rogers, 1995; Silverstone and Haddon, 1996; Agarwal and 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 in a process of mutual adaptation or domestication of technology. Other researchers (Rice and Rogers, 1980; Johnson and Rice, 1987) speak of reinvention of the technology when the adopted technology is used for functions for which it was not intended. With broadband this is very well imaginable, maybe even more so than for other technologies, because there are so many different applications and services that are and will be offered. Every service or application offered via broadband means 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, it is not sufficient to look at characteristics like income, education 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 probably not incorporated in people's daily lives as it is now. Therefore, it is interesting to see whether clusters of internet users can be recognised, 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 recognise the same clusters over the years or do we see new kinds of clusters emerging and others disappearing? Consequently, the research questions for this exploratory study are:

- To what extent can individuals be clustered based on their Internet usage patterns?
- How can the clusters be characterised (demographics and internet experience)?
- To what extent can these clusters be recognised over the course of time?

ICET-model

For this research we identified four needs that can be gratified by the internet. These needs are mainly deduced from Uses and Gratifications research (Katz et al., 1973; Katz et al. 1974). 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 four distinct, but not mutually exclusive activities.

The need for information

In research into the needs and uses of the internet, researchers have highlighted in one way or another the need for information. According to Katz et al. (1974), this need is a cognitive need. But also McQuail (1987), Rubin (1994) and Papacharissi and Rubin (2000) mention this need. It is often proved that information gathering is an important reason to go online (Maltha at al., 2002; Maltha et al., 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 et al., 1974), Social interaction (McQuail, 1987), Social companionship (Rubin, 1994), Interpersonal utility (Papacharissi and Rubin 2000), show it all comes down to the need people feel to be in contact with other people. The internet has also brought tremendous changes to this need. It is now possible to be in contact with almost everyone, independent of time and place.

The need for entertainment
Besides the need for information and communication, it is also important for many people to have their need for entertainment gratified. Other U&G researchers have focussed attention on this need: entertainment (McQuail, 1987), escape (Rubin, 1994), affective and tension release needs (Katz et al., 1974), and pastime and entertainment (Papacharissi and Rubin, 2000).

The need for transactions
Completing online transactions is an increasingly important driver to go online, thanks to the lower economic transaction costs (e.g. compared to finding a physical seller, transportation costs and duration). 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 translated into internet activities. Respondents were asked whether or not they had ever used each of these services (Table 4.1).

Information	Communication	Entertainment	Transactions
search engines	Messenger	Gaming	Buying service or product from provider
portals	Chat website	Watching Online films	Online marketplaces for individuals
Websites (url or favorites)	IP-telephony	Downloading films	Auction website
Reference works	Webcams	Uploading films	Tele banking
Streaming audio/video	Reading of a weblog	Owning/maintaining a community	Reservations
News letter	Writing/publishing a weblog	Participating in communities	
News group	E-mail	Downloading/watching tv	
Discussion groups (information sharing)	SMS (from Computer to mobile)	Downloading/watching videoclips	
Own website (information sharing)	News group	Sharing videoclips	

Information forms	Listening to music
	Downloading music
	Entertainment
	via sharing music
	Downloading photos
	Sharing photos
	E-mail
	Surfing (fun surfing)

Table 4.1: The functions of the Internet

Research method and data collection

Longitudinal data

The data for this chapter has been 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 stage 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 behaviour. Questions are on 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 organise 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 summarise 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 mostly 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. Thus, we had to recode the data collected in 2001 to the same detail level of 2003 and 2005. In order to do so, we determined the top 3 activities from the 5 point scale by taking the highest scores per respondent per ICET element. Dice was chosen as similarity measure (also known as the Czekanowski or Sorensen measure). With this index, joint absences (0-0 matches) are excluded from consideration because only the top 3 activities were used and the rest of the activities had the value 0, so there were many 0-0 matches. 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 as small as possible. This method is therefore appropriate if the research purpose is homogeneity within clusters.

After examination, we concluded that it would be best to divide all datasets into five clusters. The procedure we followed was to examine incremental changes in the agglomeration coefficient as fewer clusters would leave out information, while more clusters would not add more information. Although each year has five clusters, there are some differences in size. None of the clusters however, is too small to be taken into account for further analysis.

Results

In this section we will first of all describe the main differences in usage patterns and characteristics of the internet users in the clusters per year. Tables 4.2, 4.3 and 4.4 present the characteristics of the internet users in the clusters. While interpreting the clusters and the developments in usage patterns over the years, it is important to bear in mind, that different respondents are reached in the different datasets.

2001

The largest cluster in 2001 is cluster 3 (N=342). Like in (most) other clusters, the people use search engines for information, communicate via email and messenger, they like surfing the web for fun, download photos, and do telebanking. More than others, they enjoy email as a way of entertainment. Another difference from other clusters is that this cluster frequently uses portals to get the required information. Furthermore, they use audio and video for information. Summarizing, we can say that these people show moderate, functional usage patterns. As can be seen in Table 4.2, this cluster predominantly consists of men; 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.

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 who 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 its internet users show differences in the way they complete transactions. They have the highest scores for: buying products or services from official providers, transactions 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% are under 40 years old), are highly 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 others because of the use of newsletters and newsgroups for information as well as for communication. These internet users can be

characterised as serious debaters. The people in this cluster have a higher education 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% have 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), it does use reference works (online telephone guides etc.) to get information. Like clusters 3 and 5, they use audio and video for information. People in the cluster are mainly aged between 20 and 40 (55%), and have mid to higher education (41%). This cluster contains more women than the others (12%) and there are relatively many narrowband users (21%).

2001						
	Cluster	1 (N=261)	2 (N=89)	3 (N=342)	4 (N=92)	5 (N=288)
Characteristics						
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%
	less	0%	0%	0%	0%	0%
duration online	<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%

Table 4.2: Characteristics of internet users in clusters in 2001

2003

In 2003, the largest cluster is cluster 1 (N=744). The rather moderate usage pattern is made up of using search engines (as is the case with all the other clusters), portals and more than in other clusters, directly accessing a website by typing in the URL or clicking on the website from 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. Their only online transaction is telebanking.

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 their 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 are done by almost all clusters in this year, also by cluster 3. Apart from cluster 3, however, none of the other clusters owns, maintains or uses 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 a great deal of information via portals and also reference works are used as sources of information. Messenger for communication is used moderately, as are online gaming opportunities. Fun surfing is done a lot and this cluster makes the most online reservations.

The remaining cluster 5 shows moderate usage and uses reference works more than the other clusters and also portals more than three other clusters. Downloading photos and fun surfing are done to a certain extent.

Characteristics	Cluster	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%
	less	0%	0%	0%	2%	1%
duration online	<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%

Table 4. 3: Characteristics of internet users in clusters in 2003

Concerning the age of respondents, clusters 1, 3 and 4 do not differ significantly. Furthermore, cluster 2 consists of a lot of young Internet users whereas older people (40-60 yrs and 60+) are predominantly clustered in 4 and 5. Difference in education is slight 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: clusters 1 and 2 have a high level of frequency (more than once a day) and duration, whereas clusters 4 and 5 show less frequency and duration. Additionally, fewer in clusters 4 and 5 are connected to broadband in contrast to the other groups.

2005

In 2005 the largest cluster is cluster 3 (N=425). This cluster, like all the others, uses search engines, email, telebanking and to a lesser extent fun surfing. The people in this cluster make good use of audio and video for information and they are the only ones to share information via their own websites. Also messenger is used frequently for communication. Watching films online is done by no other cluster than this one and also gaming is done to some extent. Downloading music is very popular with this cluster. Furthermore, they use a range of online transactions: 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 how this cluster entertains itself although not very frequently. Fun surfing is a more important form of entertainment. With regard to transactions, they use telebanking and buy directly from official suppliers of services and products.

Special in Cluster 4 (N=185) is the use of discussion groups, which no other cluster does. Also newsgroups for communication are popular. Furthermore, there is a varied usage pattern of audio and video, which is only 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 official suppliers sites are the most used transaction functions, but also marketplaces are visited and reservations are made.

In cluster 2 (N=129), e-mail for entertainment is popular and fun surfing is done. The functions used for information, communication, and transactions 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 the others. 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.

Characteristics	Cluster	1 (N=87)	2 (N=129)	3 (N=425)	4 (N=185)	5 (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%

Table 4.4: Characteristics of internet users in clusters in 2005

In 2005, older respondents are more clustered in 1 and 5 (and to a certain extent cluster 2). And so cluster 3 contains more young respondents (< 20 yrs). Concerning education, clusters 4 and 5 are highly educated, whereas cluster 2 shows a significantly lower level of education. Clusters 3 and 4 are predominantly connected to broadband: 97 per cent.

These respondents (3 and 4) in general started to use the Internet one year before others (clusters 1 and 2). The other clusters, certainly the second one (47%), make use of narrowband as well. Interestingly, the frequency and duration of Internet use are consistent with that.

Developments of internet functions

In this section some of the most noticeable developments in the usage of internet functions are described. The first thing that becomes apparent in table 4.5, is that over all the years, every cluster uses search engines frequently for information, email for communication, fun surfing for entertainment and telebanking for transactions. There are, however, some fluctuations and we will elaborate on these below.

Information
Search engines are used by every cluster, every year. We do, however, see an increase in the frequency with which they are used and the usage becomes 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. Usage has not become more or less frequent over the years. What is striking, is that it only gets used very intensively by one cluster. This internet function 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 their own website is not something for many internet users between 2001 and 2005, nor does this get used very frequently.

Communication
Messenger is popular from 2001 to 2005. The main changes we see, are that fewer clusters use it (in 2001 four clusters and in 2005 three), but the usage is more intense. Special websites for chatting (chat rooms) are quite intensively used in 2001 by one cluster, but in 2003 and 2005 it is not in the top three of any cluster. Webcams and web logs 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 every cluster every year.

Entertainment
With regard to gaming, we see that the number of clusters practising online gaming initially increases and then decreases, but that the intensity, especially in one cluster, increases. A similar pattern is observed with downloading music. This seems to be something many internet users have tried, but will only become a true leisure pursuit for a few internet users. Downloading photos is done by all clusters and quite frequently, but over the years, usage becomes less frequent and by fewer clusters. Fun surfing is constantly used by many internet users and quite frequently.

Transactions

In 2001, transactions, apart from telebanking, are only completed by one cluster, whereas in later years the usage is much more spread over (internet) society. Buying products and services from a website of an official supplier has become more widely and intensively used.

	2001					2003					2004/5				
Information via…	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
… search engines	★	★	✦	✦	✦	★	★	★	✶	★	✶	✶	✶	✶	✶
… portals		⅄	★		⅄	⅄	⅄		✦	✦	✦	✦	⅄	⅄	✦
… websites (url or favorites)	.	.	.	.	.	✶	⅄	✦	⅄		.	.	.	.	.
… reference works	⅄								⅄	✦	✦		⅄	✦	✦
… audio/video	⅄		⅄		✦		★						★	⅄	
… newsletter				★											
… newsgroup				★		.	.	.	.	.	.	.	.	.	.
…discussion groups	.	.	.	.	.			★						⅄	
… own website								⅄					⅄		
… information forms															⅄
Communication via…															
… messenger	⅄	⅄	⅄		★		✦	✦	⅄			⅄	★	★	
… chat website					✦										
… IP-telephony															
… Webcams	.	.	.	.	.	.	.	.	.	.					
… Reading of a weblog	.	.	.	.	.										
… Writing/publishing a weblog	.	.	.	.	.										
… e-mail	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶	✶
…SMS (from computer to mobile)					⅄										
…newsgroup				✦				✶						✦	
Entertainment via…															
…gaming					⅄	⅄	⅄	⅄	⅄		⅄		⅄	✦	
…watching films					⅄		⅄						⅄		
…downloading films					⅄	.	.	.	.	.	.	.	.	.	.
…uploading films															
…owning/maintaining a community	.	.	.	.	.			⅄							
…participating in communities	.	.	.	.	.			⅄							
…downloading/watching tv	.	.	.	.	.										
…downloading/watching videoclips	.	.	.	.	.		⅄		⅄		⅄				⅄
…sharing videoclips	.	.	.	.	.						.	.	.	.	.
…listening to music					✦	.	.	.	.	.	.	.	.	.	.
…downloading music					★	⅄	★	⅄	⅄				★	✦	
…sharing music	.	.	.	.	.										
…downloading photos	★	★	✦	★	⅄		⅄		⅄	⅄	✦		⅄		⅄
…sharing photos					⅄						.	.	.	.	.
…e-mail			⅄		⅄		⅄	⅄	✦			✶		⅄	
…surfing (fun surfing)	✦	✦	✦	⅄	★	★	✦	★	★	✦	⅄	✦	✦	★	★

Transaction via…															
…buying service or product from provider		★					✦	✦	✦			⅄	✦	★	★
…online marketplaces for individuals		⅄									⅄		⅄	⅄	
…auction website		⅄													
…tele banking	★		★	★	★	★	★	★	★	✶	✶	★	★	★	★
…making reservations		⅄					⅄	⅄	✦				⅄	⅄	⅄

⅄ 20-40%; ✦ 40-60%; ★ 60-80%; ✶ 80-100%
. no measurement for this activity in the relevant year

Table 4.5: Usage of internet functions by clusters in 2001, 2003 and 2005

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 to people in different clusters. We do however see cluster characteristics recurring over the years, such as internet users interested 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, one group of people distinguishes itself by performing more online transactions than others. We do not 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 in the various clusters. We focussed on demographics, experience and the connection used (broadband vs. narrowband). Here we do not see really clear distinctions. Thirdly, we aimed to identify changes in 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 show that over the entire period, all clusters use search engines frequently for information, email for communication, fun surfing for entertainment and tele-banking for transactions. Based on our analysis of the clusters and developments over the years, we conclude that there are two dimensions in the diffusion process: intensity and spread over (internet) society (Figure 4.1).

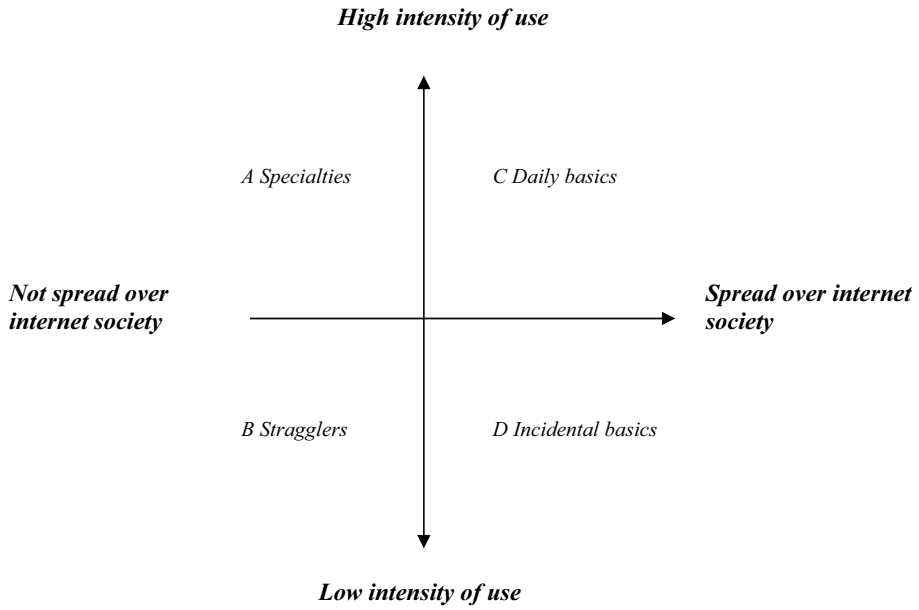

Figure 4.1: Extent of changes in internet functions over time: intensity and distribution over (internet) society

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)
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 over the years some functions of the internet have been more intensively used and others less frequently. Also some functions are used more and more by specific groups, whereas others have become general functions for nearly all internet users.

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CHAPTER 5

Risk takers and choice makers: Their (non) use of new media Age and risk perception during a choice process

Enid Mante-Meijer and Eugène Loos

Introduction

In broadband society, more and more citizens will be confronted with the possibilities and necessities of making use of digital information channels. The general aim of the European Commission is for all public services and information to be offered digitally in the broadband society, so that all citizens automatically make use of them whenever they need to, i.e. broadband society as a way of life (Loos et al., 2008). Especially in regions and countries of Europe where, like in the Netherlands, there is a high computer density and widespread access to the Internet, governments are working hard to reach this aim with respect to services and information to the citizen.

Although in recent years, more and more attention has been 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, some surveys were conducted on the state of the art of citizen's usage of electronic public services (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 them (Heres et al., 2005), respectively their actual use (Van Dijk, 2005, 2006; Vermaas, 2007).

The percentage of so called 'digibetes' (persons without a pc or not using a pc/Internet in their everyday lives) is still around 21%. A higher percentage, about one third of the population, has only a limited experience with and knowledge of the use of new media, like web sites, even if they do have access to the Internet. Such citizens do not need electronic public services and hence do not bother to look for digital information.

Case study

It is not clear what people actually do if they are confronted with the necessity of making choices in a particular situation, which involves the gathering of information in a multi-channel landscape. 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 obtain the information needed for making the choice. In 2005, in order to lower the cost of health care, the Dutch government decided 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 wealthier members of the population, who were free to choose their insurer and the amount of cover they desired. Under the new system, this difference was eliminated. All

citizens were henceforth responsible for effecting their own basic health insurance, with the insurance company of their choice and the extent of coverage desired. A great number of information channels, digital and non-digital, were available to the public to enable them to make their choice. This was the background for our research into the actual choice process and the information channels citizens used to enable them to choose (Loos and Mante-Meijer, 2007).

A fitting theoretical perspective that offers some general direction to our research is the theory of structuration (Giddens, 1984) which helps us not only to understand how IT structural properties might enable or constraint human action, but also provides IT researchers 'with a theoretical approach that helps them understand how user's interactions with IT evolve, what the implications of these interactions are and how we can try to deal with their intended and unintended consequences.' Pozzebon and Pinsonneault (2005: 1356) Giddens (1984: 25) explains the characteristics of his theory of structuration as follows:

> 'Crucial to the idea of structuration is the theorem of the duality of structure, which is logically implied in the arguments portrayed above. The constitution of agents and structures are not two independently given sets of phenomena, a dualism, but represent a duality. According to the notion of the duality of structure, the structural properties of social systems are both medium and outcome of the practices they recursively organize. Structure is not 'external' to individuals: as memory traces, and as instantiated in social practices, it is in a certain sense more 'internal' than exterior to their activities in a Durkheimian sense. Structure is not to be equated with constraint but is always constraining and enabling.'

The theory of structuration 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:

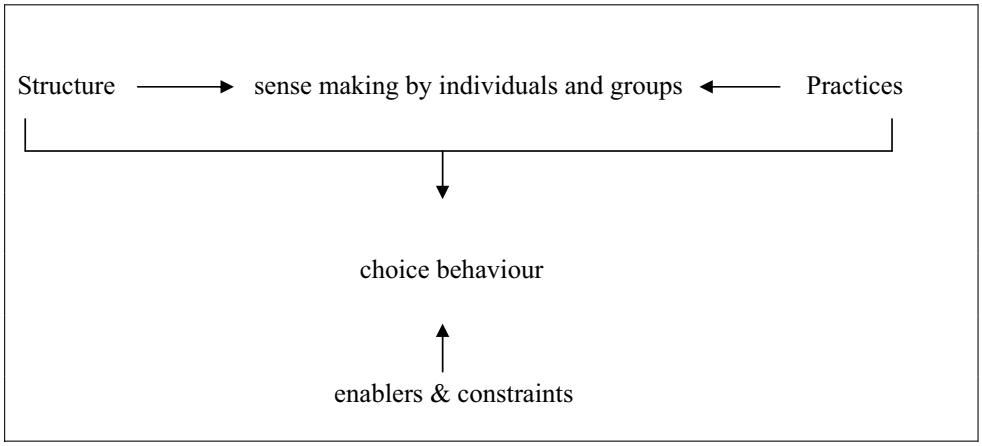

Figure 5.1: choice behaviour and enablers & constraints

In our case study, the choice of information channels was governed by the following structural conditions: The position of the individual in a rather egalitarian society in which a social health system operates that satisfies most citizens, the availability of digital information to all, combined with a tendency to liberalisation and privatisation and a wish to reduce the costs of health care for government budgetary reasons, together with obtaining more efficiency in health organisations. Sense making in this context is 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, risk perception related to health and the enablers and constraints in his/her own environment to use a certain information channel. Practices relate to the existing practices of health care consumption and information gathering, the actual behaviour of people before and after the new health system was introduced and people were forced to make choices.

Other theories explaining human choice behaviour in more detail we will use are:

- humans as risk takers (Douglas and Wildavsky, 1983)
- humans as maximizers (homo economicus): choosing what is the most profitable (neoclassical theories), they can be considered as rational risk takers
- humans as satisficers (bounded rationality): choosing the first that in general satisfies the needs and not looking further (Simon, 1979; Schwartz, 2004), calculated risk takers
- demotivated humans: people becoming passive by having to choose and sitting back (Iyengar and Lepper, 2000), choice and risk evaders.

Research questions and research design

We answer the following research questions in our chapter:

(1) How do people in everyday life react in situations where they are forced to make choices?

(2) Faced with a multitude of information channels, which channels do they choose in order to make their decision?

(3) What is the role of digital information channels compared to the more 'classic' non-digital channels?

The case study aimed to provide more in-depth insights into 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 released in the course of November 2005. People were given until the end of March 2006 to make a decision, and had to effectuate their choice by signing a contract with an insurance company by the end of April 2006.

In order to approach the real choice process as closely as possible, 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 2006, when recollection was still strong. Use was made of a systematic topic list in which we asked each respondent a number of 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 for making a their final choice.[1] Special attention was given to the use and the evaluation of both digital and non-digital information channels during the search and decision making process. Apart from these qualitative focus interviews, a small questionnaire was handed out to the respondents to control the qualitative material and to obtain further quantitative data. Respondents were citizens who made the choice themselves or together with a partner. They were selected along two main dimensions: age[2] and gender.[3] Students of the Utrecht School of Governance at 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.

As the study was an explorative one, intended to provide qualitative insight into the processes of choice in a small sample of respondents, we were not concerned about generalisation, but more with variety. The emphasis was therefore on focussing 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 collected a sufficient number of people with a combination of the selected characteristics. The division of gender was about equal (48% male and 52% female), the division of age groups was: 32% between 24-34 years of age, 28% between 35-54, 24% between 55-64, 10% between 65 and 74 and 6% was 75+.

Results

Citizens' 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 felt happy about the idea of choosing. Even those who were in favour of 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 commented negatively, i.e. varying from:

- *A lot of trouble.*
- *There is something here I can't quite 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.

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[1] We divided the choice process into four stages: first: reaction to the new obligation, orientation, making a choice and contracting an insurance company, evaluation afterwards.

[2] The age groups consisted of five categories: 24-34, 35-54, 55-64, 65-74 and 75+. 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.

[3] We aimed at having 50% male and 50 % female respondents.

Moment of choice
Two-fifths of the respondents had made their decision by December, half of whom were from the lowest educational groups. 6% waited until the last moment (April). These latter respondents were relatively often highly educated. 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 an interesting offer appeared. 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 to be sent 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 were they were, or to change insurance companies.

Citizens' use of information channels 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 remained relatively unused: 34% of those with access to the Internet made no use of this (see also the capability model developed by Heres et al., 2005).

Digital sources were mentioned even less frequently than the government spots on TV. They were mostly used for additional information. If people looked at sites, they tended to visit the sites of the insurance companies themselves. The sites that gave a comparative overview on offers from insurance companies were seldom used. 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:

- *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 opinion about sites were 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: those without Internet even felt somewhat more sure about their choice than those with Internet, although the former group was also the group most likely to choose not to change insurance companies. There was no difference in certainty about the choice made among the respondents with Internet, whether or not they had made use of new media.

Citizens as maximizers, satisficers or demotivated humans and their use of digital sources

Health care is so expensive that most people need a health insurance. Illness and its costs are a risk. In our opinion it is therefore important to take into account the way people perceive this risk if we want to understand how they choose their health insurance. We use insights from Douglas and Wildavsky (1983: 5, 6, 9) who consider risk as:

> 'a joint product of *knowledge* about the future and *consent* about the most desired prospects' and we agree with them that 'the perception of risk is a social process', that 'people select their awareness of certain dangers to conform with a specific way of life (…) and that people who adhere to different forms of social organisation are disposed to take (and avoid) different kinds of risk.'

In our case study we found three types of risk takers choosing a health insurance related to the use of (non)digital sources: **maximizers**, **satisficers** and **demotivated humans**. As we will see age and life events play an important role in the way people perceive risks concerning costs for their health insurance.

- People between the ages 55-74 made use of both non-digital information channels, such as paper brochures from insurance companies and digital information channels, such as the Internet. This group, comprised of people nearing the end of their working career or retirees (a crucial life event[4]) nearing old age, that was most concerned about obtaining the best possible health insurance. This group was also the group that spent the most time, scouring for the best offer and the group whose members were most often likely to have changed insurers; this group boasts a relatively large proportion of **maximizers**[5]. They choose what is the most profitable and can be considered as rational risk takers:

  > 'If you seek and accept only the best, you are a maximizer. (…) Maximizers need to be assured that every purchase or decision was the best that could be

[4] Loos and Mante (2007: 73-74), Kalmijn et al. (2006) and Sap (2004).
[5] Neo-classical theories.

made. Yet, how can anyone truly know that any given option is absolutely the best possible? The only way to know is to check out all alternatives.' (Schwartz, 2004: 77)

– The age group between 35 and 54, however, was largely made up of **satisficers**[6] who can be considered as calculated risk takers. This is the alternative to maximizing:

> 'To satisfice is to settle for something that is good enough and not worry about the possibility that there might be something better. A satisficer has criteria and standards. She searches until she finds an item that meets those standards, and at that point, she stops.' (Schwartz, 2004: 78)

The age group between 35 and 54 chose what was good enough for them. This was also the group that used the greatest variety of information sources. This group is in the rush of life, with career, having children (an important life event) and other obligations, and hence lack the time to choose the best health insurance, but do have the responsibility to make a responsible choice for the family.

– A third group of respondents, **demotivated humans**, had a completely passive attitude[7]: they were not interested, or it was not important for them, so they let others (or fate) decide for them. A substantial part of this group belonged to the oldest and the youngest age category. As could be expected, the use of digital sources was lowest among the oldest members of the population (75+) who are not able to use such sources. But the case study also showed that most people in the age group between the ages 24 and 34 did not spend a lot of time to choose the best possible health insurance and did not make use frequently of (non)digital sources![8] Is their health (still) too good to bother about this issue?

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, to their mind, were well regulated and still functioned satisfactorily. People were in general satisfied with the health insurance they had. Also, large companies and government institutions generally had long since introduced a system of collective insurance which reduced costs.

In fact, the system of two types of health insurance had to a large extent already lost 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 were eligible for more services than the group having 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:

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[6] Simon (1979) and Schwartz (2004).
[7] Iyengar and Lepper (2000).
[8] Though they are able to use digital sources they do not want to use them. See also the capability model developed by Heres et al. (2005).

- *It was simply a nuisance.*
- *I did not like to spend time on this.*

The most important enabler for choosing was the fact that after the month of December, many companies, the trade unions and the union of the elderly offered collective contracts that were highly profitable. That persuaded quite a few people decide to switch.

Another enabler was the fact 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. **Maximizers** in particular saw an opportunity to obtain 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. Yet even a not inconsiderable number of people who decided from the beginning to stay with their own insurance company used some information channels, if only to verify their choice not to change. The comparative sites especially constructed for this purpose, however, were not used very often.

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.*

At the start of the choice process, the most enabling source of information was the information found in newspapers, on TV and radio, while in a later stage the written information received from the insurance companies themselves and from the organisations at which the respondents work was also influential. Significant other people (family members, friends, colleagues) played a quite important role during the decision-making stage as enablers, to compare the own ideas with the decisions and ideas of others.

At the start of this study, we presented our research questions, which we linked to theory of structuration and theories of choice behaviour. The following evaluation and discussion present a short overview of our main findings.

Evaluation

(1) How do people in everyday life react in situations where they are forced to make choices?

- The idea of change (choosing a health insurance company) was not very popular in the Netherlands. The majority of Dutch citizens were satisfied with the prevailing situation and saw the upcoming change as causing trouble and a lot of unnecessary work.

– We found three types of risk takers and choice makers:

  (I) **Maximizers**, individualists who were gratified with the opportunity to improve their situation and to negotiate a better health insurance package. A relatively large proportion of these rational risk takers belonged to the age group 55-74.

  (II) **Satisficers**, who were satisfied with the current situation and did not plan to spend more time than necessary in the choice process. A relatively large number of these calculated risk takers were aged between 35 and 54.

  (III) **Demotivated humans** 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. Quite a large part of this group of choice and risk evaders fell into the youngest (24-34) or the oldest age category (75+).

(2) Faced with a multitude of information channels, which channels do they choose in order to make their decision?

– There were numerous channels from which information on insurance policies and companies could be obtained. At the start of the choice process, the most enabling sources of information were newspapers, TV and radio. Later on, the written information distributed by the insurance companies themselves and by organisations and employers to their employees also proved to be influential sources. Significant other people (family members, friends, colleagues), with whom ideas and decisions were compared and discussed, played quite an important role during the decision-making stage as enablers.[9] Other commonly-used information channels were the websites of the insurance companies.

– In most cases, people made use of a mix of information channels, even those who very early had 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 pc and Internet density is very high in The Netherlands new media were used far less than was possible. About one third of the group of respondents with access to the Internet made no use of this at all, while the remaining two-thirds relied more heavily on the non-digital information obtained via the 'classic' channels than on the new electronic medium.

[9] See also Bakardjieva's 'warm expert' in Verhaegh's chapter (No. 11) in this book.

- In general, the availability of so much information enabled the choice for at least part of the respondents. For others, however, it made the choice more complicated (see also Iyengar and Lepper, 2000). A more important enabler, however, was the offer of collective contracts by companies, organisations and unions, often sent via 'classic' channels.

- A final noteworthy point is the fact that a relatively high incidence of Internet use was found among those aged between 55 and 74, i.e. the older age group. However, the very old (75+) used the Internet only rarely.

Discussion

Although in the Netherlands, Internet is a firmly established information channel that is available to the large majority of the population, people still do not automatically make (maximum) use of it when confronted with important choices in everyday life. People still tend to prefer the 'classic' channels and face-to-face contacts to the digital way. Other chapters in this book point to the same phenomenon: The video on demand study of Van den Broeck et al. (chapter 2) and Agnes Urban's mobile TV (chapter 3) study show that people tend to stay with the 'classic' channels and old habits even if they have the choice to make use of new ways. Old habits die hard and as long as the new opportunities do not offer something that is really conform their needs and wishes, they do not choose to change their ways of life.

Moreover, the information is not always easy to find and easy to handle. Digital services and information still demand routine and knowledge that quite a few people do not possess, or are not interested in acquiring. Other studies in the Netherlands point to the same problems (Van Dijk 2005, 2006). As long as these obstacles persist, the possibilities offered by a broadband society will remain underutilised. Overcoming these constraints asks for enablers. One of them is involvement of users and creating real benefits that make a try-out easier (see also chapter 11 (Verhaegh) and chapter 10 (Proulx) in this book).

Apart from this, there is a distinct difference between individuals with respect to the willingness to make choices and take risks. In confirmation of earlier research (Simon, 1979; Schwarz, 2003; Iyengar and Lepper, 2000 and Douglas and Wildavsky, 1983), we found that that it was possible to distinguish three general types of risk takers and choice makers: **maximizers** (rational risk takers), **satisficers** (calculated risk takers) and **demotivated humans** (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 users can be viewed as innovators, it is the first group in particular who in this respect can truly be considered to be 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.

Paying attention to risk perception and specific, individual-related structural factors including age and life events, such as retirement helps us to understand how people use (non)digital information channels when faced with a multitude of such channels in order to make their decision. It was arresting to find that the so-called 'elderly' were interested in the use of new media if it fits within their interests.

A large part of this group could be classified as **maximizers**, who were searching for the best possible health insurance. This group, comprised of people nearing the end

of their working career or retirees (a crucial life event) nearing old age, that was most concerned about obtaining the best possible health insurance. This group was also the group that spent the most time, scouring for the best offer and the group whose members were most often likely to have changed insurers. In this respect, they were more 'innovative' than younger people, who, although they often have the ability to use new media, do not automatically make use of these in ambiguous choice situations.

The age group between 35 and 54 was largely made up of **satisficers**: they chose what was 'good enough' for them, although this was also the group that used a greater variety of information sources. This group is in the rush of life, with career, having children (an important life event) and other obligations, and hence lack the time to choose the best health insurance, but do have the responsibility to make a responsible choice for the family.

A third group of respondents, **demotivated humans**, 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 substantial part of this group belonged to the oldest and the youngest age category.

Finally, we can conclude from the results of this case study that:

- There is *no* traditional 'digital divide' between young people making use of new media all the time and older people not using them at all. A 'digital spectrum'[10] is a better notion to characterise the situation.

- If we want to understand how people in ambiguous choice situations make use of (non)digital media it is important to pay more attention in future research to risk perception, age and life events, such as retirement.

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CHAPTER 6

The users' shaping of networked communication

Gustavo Cardoso and Rita Espanha

Are users innovators?

The new communicational paradigm of our societies is built around the increasing role of the user as innovations developer and innovator in media content to be read, listen or viewed by others. Users have been increasingly addressed as innovators in media, not only because of the dissemination of the Internet and open source technologies but also because of the individualisation of media, namely mobile phones, video cameras and handheld mp3 and video players.

Innovation has to be understood as a dialectical process between participants of unequal power and influence in the marketplace and in the on-going patterns of consumption and use (Silverstone, 2005). As Silverstone (2005) argues, SMS and file sharing have gained almost an aura of mythology in ICT innovation given that both were seen as signs of a radical shift in how innovation takes place, by rebalancing the way producers (technologist, designers, packagers, market analysts, investors) and the consumer interact. The mobile phone industry, taking notice of the SMS uses by youngsters incorporated such knowledge on new mobile phones and services offered (Silverstone 2005; Colombo 2006). Subsequently, the user started to be seen, by the industry, as 'trend definer' or 'active tester of innovation' (De Marez and De Moor, 2007). The innovation processes became less confined to the industrial environments because the quality of experience is measured through the launching of a high number of models into the market and by monitoring the user's choice, in order to redefine which models to improve and which to drop.

When users innovate they become, no longer 'end-users' (Slot, 2007) because they move into the heart of the very own value chain, that is, to the creativity arena. Creativity in a user centric approach, as the one that we are witnessing, depends on the ability of people to organise informal networks (be it companies or organisations that develop beta services/products) and then being able to attract users that will contribute to the definition of the next stage. Such attractiveness depends, in great measure, on the ability to open up the floor and work on the environment, hopping that such an offer will create the conditions for experimentation and creativity to develop among a given growing mediated community, usually web 2.0 sites, but also allowing monitoring the feedback. But the continuity of innovation by users seems to depend also on the development of a group of core members that can motivate the passer-by contributors and, by doing so, to sustain the evolution from episodic networking into structured networking during a given timeframe (Auray, 2007; Verhaegh, 2007). Nevertheless, the business success of the social appropriation of users innovations processes, such as MySpace or Facebook, seem to better develop under organisational cultures that are less structured and that rely more on innovating the ways in which they present themselves, that is, where the 'we' is predominant instead of the typified mediated relationship between 'we', the site management, and the users, being the 'other' (Silverstone, 2006). Examples of such relationships between opposing organisational cultures have been

found in experiments of 'citizen' and 'participatory' journalism where the journalistic culture is, usually, conservative and not innovation driven towards experimenting new relationships with other content producers outside the newsroom, and where marketing and business cultures seem to be more open to those innovations (Paulussen et al., 2007). The success of the innovation performed by users in 2.0 Internet environments is then seen as somewhat dependable on the model of self-presentation and intercommunication (Koskela, 2007) offered by the software platforms or the ways in which the user is allowed to modify them.

But 'users as innovators' are not confined to the web 2.0 successes. Other innovation areas for the user seem to be found almost in every area of dissemination of ICT's software or hardware. The multiplication of personal, mobile and video hardware brings to the user the ability to domesticate new kinds of audiovisual content and, subsequently, to introduce time-shifting domestication processes, that is, the capacity of individual and societies to tame the unfamiliar and the threatening, and by doing so mould these new technologies to the values and habits of their everyday life's (Silverstone, 2005; Van den Broek et al., 2007; Urban, 2007). As an example, the user can also become innovator when it appropriates interpersonal communication devices, such as SMS, for organisational purposes facilitating knowledge and allowing planning differently their lives and increase the cohesiveness within a given group (Byrne, 2007).

The second major area of innovation by users is content. The content originating from the processes of content innovation, driven by the users, has two major types of appropriation. Either they are fuelling the overall offer of newspapers, radio and TV, that are running Internet operations. Or we have individual, and collective, projects of content generation primarily developed for the Internet, although they might evolve in the future for other distribution channels – like the US RocketBoom news, starting online and being now downloadable for the Home TV sets through cable networks. In the first alternative, through the online environment the user establishes with the newspapers, radio and TV, multiple relationships that range from the writing and publication of articles, opinion columns or videos to the participation through comments, rating or sharing of contents (Picone, 2007). The second alternative seems to be where the user is allowed more freedom of creativity and, consequently, where innovation is more attainable and valued.

Although, recognizing the innovating role performed by users in terms of the new availabilities of content, user generated content is not yet being produced by the majority of the world's online users. The analysis of data shows that, in the USA, only 8% of web users had, in 2006, edited a blog (Idate, 2006). Similar figures are found both in France, where only 7% of the population had ever built a blog (Idate, 2006) and Portugal with 12% (Cardoso, 2006).

Other examples of user generated content, now regarding video production, can also be found. For example YouTube, where more than 5 million videos were available in late 2006, had around 30 million of unique users each month, with more than 100 million video streams per day. Nevertheless, YouTube uploading of videos seems still to be involving less then a tenth of people editing blogs (Auchard, 2007). User generated content can also be found in social sharing, or Web 2.0 so called sites. Websites like MySpace were, in late 2006, generating more than 270.000 new members per day (Auchard, 2007).

Another channel for distribution of user generated content is the P2P networks. Such networks were in Europe, in 2006, attracting between 15% and 35% of Internet

users and, in the USA, 25% of users, mainly teenagers and young adults were using its services (Idate, 2006). Although better known for the piracy of copyright contents that regularly hit the pages of newspapers, P2P networks offer many non copyrighted material or, sometimes, remixes of audiovisual contents (Hesmondhalgh, 2007). In some specific areas of copyrighted material, like continental European cinema, P2P networks even have a good chance of evolving towards being the main distribution channel. European cinema, both financed by the national European boards or by the very European authors, doesn't have, in many countries, access to good distribution, being P2P a good alternative to reach audiences.

Users have become main innovators in the network society, but the user is also very different one from the other. So we can characterise one of the main trends of the new communicational paradigm to be the innovation performed by users, but we must understand that specific users innovate in specific areas, the ones where communication is seen as most important for them, be it SMS, video content, blogs, etc (Silverstone 2005; Lull 2007).

The user's role in a new communicational paradigm

Because technological development and the appropriation of the media place in coexistence mass media, interpersonal communication media and media that combine the two, such as the Internet, the principle characteristic that pervades the whole sphere of communication is that of networking. But networking is not the only dimension shaping communication. We are also witnessing a change in the communicational paradigm that shapes the media system. The change in our communicational paradigm can be witnessed through the analysis of several dimensions, and the more important dimension is related with the role of the users shaping those networks.

Our mediated world, shaped also by us 'the users' is today dominated by a media rhetoric mainly built around the visual component (Howell, 2003). The visual has gained, increasingly, importance over the textual, even within the Internet realm. Such gain is the product of technological development, like broadband, but also of users choices. Users have chosen to increase their viewing of entertainment and news embedded in visual formats, domesticated the use of video in Web 2.0 platforms and have diffused worldwide the social appropriation of the mobile phone as a video recorder and camera. Still focusing on the users, we should also stress the role that the visual plays within the users computer mediated communication. We should acknowledge that, even when we refer to aural or verbal modes of communication, within the Internet, we are analysing a mediation process that combines both visual and textual or visual and aural. Skype and other VOIP programmes, or verbal script media like Instant Messaging, programmes or even email are increasingly combining the use of visual modes of communication, too. So what we are witnessing is not a overwhelming victory of visual against other mediated communication modes but the increasing mixture of the visual with other modes of communication (Fornas et al., 2007) a trend that we can traced back to the 1980's experiments on the relationship between music and moving image and the worldwide success and expansion of the MTV genre and video clip production (Frith et al., 1993).

Clearly, instead of trying to conflate the verbal/nonverbal and visual/aural polarities, we should focus our attention on the multidimensional complexity of human communication faculties, in order not to oversimplify historical trends or momentary

transitions (Fornas, 2007). Inside and outside, the Internet we find an overwhelming rhetoric based on visual culture, a culture founded on a mode of communication based on simplicity, rapidity and emotions in which 'to see is enough to be' and where 'to repeat is to inform' (Ramonet, 1999). We are witnessing, all around the world, live experiments fostered by television companies, radio stations, newspapers and Internet companies, such as Google or Yahoo!, on how to combine verbal script and aural rhetoric's of communication with the use of chats, SMS, e-mailing, podcasts, video, etc. Although not being yet able to ascertain what the media world will innovate in this domain, the trends seem to indicate that traditional media, as newspapers and radio, and also individual users, are trying to explore how video can complement their traditional textual scrip and aural rhetoric's by enhancing their growing Internet presences with moving images, broadcast and downloads. Television's Internet presence is also trying to evolve, using the World Wide Web or the P2P networks, from more textual and aural approaches to the full broadcast of moving images.

Innovation in Entertainment and News Models

Another of the dimensions of the *new communicational paradigm*, where users play a powerful innovation role, is the Innovation in News and Entertainment Models. What are the new trends that have a major influence on the way our world is being shaped, and consequently, on the way our news and fiction are being told?

Each Era has its predominant genres and modes of broadcast representation (news, chat show, soap opera), as well as different ways to express the uniqueness of the individual (popular music culture, blogging, messaging, file sharing). Although they represent the search for different kinds of order and a struggle for power and control over one's immediate material and symbolic space and time (Silverstone, 2007), they work differently over time and space. Both news and entertainment have been changed in their nature by the possibility given through the arrival of the Internet and tools that foster the production and dissemination of contents by individuals (Syvertsen 2004; Beyer, 2007). But at the same time media companies have also changed their news and entertainment offers. The mixing of the two dimensions of change, one driven by individual producers the other by media companies has changed the media landscape of news and entertainment (Syvertsen 2004; Ytreberg 2004). But what common trends can we find in order to understand and typify the change in contents, both in news and entertainment?

It is here suggested that major historical discontinuities or events, within a given historical continuum, can promote change in the way we classify experience and that the media, given its classification function in society (Silverstone, 2007), are also influenced by those in the way news and fiction are produced and delivered. Social change brings changes not only to the way we organise society, institutions and family, but also to the culture of a given period in human history (Castells, 2004). The media are not only technology; they are also the contents they print, broadcast or display. It's not only the technology that changes but also their contents. Both news and fiction are embedded and shaped by the values and representations of a given society in a given time and space. For those reasons we can argue that, not only we can trace the current change in contents offer by the media companies (Miège, 1997; Hesmondhalgh, 2002; Boczkowski, 2004) back to the needs for economic growth (that lead into the territorial expansion of their audiences via satellite and cable television), and to the dissemination

of the use of the Internet, but also to major social events that have influenced our societies in the last three decades.

The argument here made is that we have witnessed, during the last decade, a change within the very own mediation processes and that change is closely related to the historical events and the technological transformation that we have witnessed between 1989 and 2001. Those two major historical events are the fall of the Berlin Wall and, consequently, the geopolitical change in Europe and around the world in the two sides of the political blocks (Castells, 2000) and the 9/11 of 2001 attack at the Twin Towers in New York. Between both events we also witnessed the growing social appropriation by media companies and citizens of the Internet and Satellite Television Broadcasting.

The works of Roger Silverstone (2002) and Umberto Eco (2007) provide us with a set of concepts that help to understand the change within the news and entertainment we today watch, read and listen, those are: *interruption*; *transcendence; otherness* (Silverstone, 2002); *boundary*; and *reserve* (Eco, 2007).

For Eco (2007) the fall of the Berlin Wall combined with the globalisation of media, first satellite TV and then the Internet, brought, to our life's, a change on the ways in which both the 'limits' of the know, the frontier between something, together with what is considered to be righteously 'concealed' or kept in 'reserve' are addressed. Such views, in his opinion, have also changed the ways in which mediation occurs and our involvement in such processes. According to Umberto Eco (2007), one of the first concepts that was questioned by the globalisation of communication is the notion of boundary. The fall of communicational boundaries brought about by the new information and communication technologies has produced two conflicting phenomena. On the one hand, there is no longer a national community that can cut off its citizens from knowing what happens in other countries – even in dictatorships it is increasingly difficult to rule this out (Eco, 2007). On the other hand, the globalisation of communications (Lull, 2007) has introduced modifications at the monitoring of communication exchange. For example, the Orwellian *Big Brother* is not the Endemol television version (Roscoe, 2005), where millions of 'voyeurs' watch one single exhibitionist. Today, the *Big Brother* watching us does not have a single face and is not alone: he is the totality of the global economy (Lyon, 1998; Rodotà, 2000). Eco's argument (2007) is precisely built around the questioning if such a change, in the roots of monitoring, is not producing a movement of cultural change in the perception of what we socially value in relation to reserve and up to where those changes influence our mediated experiences in fiction.

For Silverstone (2002) both mediation and key historical events, in our recent history, are seen as fundamental processes. The structural dimension to the mediation of events, as the one that took place on September 11, helps us to envisage the broader context of how the media represent the world to us (Silverstone, 2002). The media are the main vehicle for bringing into our lives everything that is not 'near' us, that cannot be experienced, seen, touched without mediation, be it from TV, Internet, newspapers or radio. Mediation involves three dimensions of relations between what is mediated and who participates in such mediation process: time; space and ethic (Silverstone, 2002). Events, such as September 11, bring change in the realm of time (*interruption*), in the realm of space (*transcendence*) and in the realm of ethic (*otherness*). Interruption refers to the way in which the schedule of the media, its continuity, is fundamental to define the conduct of everyday life. In a society where mediation becomes evermore present everyday routines tend to relate to the routines of the media. Routines bring assurance

and continuity, when the routine is broken we are faced with change, with questioning, with the assumption we must readapt to the new, whatever it is. Media routines are only broken when, editorially is perceived something important has happened, and that such event must be communicated. Transcendence refers to the claims of the media as to being able to address, the global village proclaimed by McLuhan (1997), the annihilation of distance to provide new forms of global connectivity by bridging distance (Silverstone, 2002). The media have always provided us with the representation of the event, not the reality, but its image. Nevertheless, they have increasingly suggested that "what you see is what you get" (WYSIWYG), that is, representation and reality are expressed has being the very same thing.

The last concept here analysed is the role of otherness in our analysis of innovation in news and entertainment models. Otherness, relates to how the 'the other' is represented to us and how we come to perceive it in our daily life's (Silverstone, 2002). An example, identified by Silverstone (2002), is that until the appearance of Al-Jazeera on western screens 'the other', in this case the inhabitant of the Muslim countries to where the Al-Jazeera broadcasts in Arab language, had been both in fiction and in news, mainly a product of the description of western media. By, simply existing, or broadcasting, Al-Jazeera showed us that we can also be 'the other', that otherness can have two ways: the way we see the others and the way the other sees us.

But how do such concepts help us understand the change in media and the way mediation is performed in the network society? Let's look at the eroding of the social value of both boundary and reserve (Eco, 2007). Such erosion has influenced the way in which journalism is practised and the way in which entertainment is built by media companies and individual content producers. This change of the concept of boundary has not only influenced the sources used in journalism and the way journalists work, but also has opened access to sources to be used by people that were not journalists and, ultimately, it also led to the access to new distribution channels for the news produced by them, namely the Internet (Cardoso 2007; Eco 2007; Lull 2007).

Our perceived social value in relation to *reserve* might also bring us some clues to answer why our current games and quiz entertainment has moved from traditional stages surrounded by audiences applauding the contestant into what we have been commonly referring to as 'reality shows'? Eco argues (2007), that in order to understand the changes in entertainment we need first to follow a path started in news production. One of the main changes in news content, in the last thirty years, occurred in the written press, a change led by the traditionally referred to as the 'celebrities press' (Eco 2007; Littler 2007; Turner 2007). Such publications, mostly wrote about famous people – actors, singers, monarchs in exile or playboys – who voluntarily exposed themselves to the observation of the photographers and chroniclers (Street, 2006). The readers knew that many times the events featured in the news stories were themselves concocted by the journalists, but the readers were not turning to these publications for news or, if we prefer, the truth (Marshall, 2006; McQuail, 2000). What the audiences looked for in such publications was mainly entertainment and not news in their more traditional definition (Eco, 2007). With the aim of competing with television and also given the need to fill a greater number of pages with stories, the generalist and reference press began to take a growing interest in social events, show business and gossip, thus altering its criteria on what constitutes a news story. Gossip became a reference information matter and even targeted those that were not its traditional targets – reigning monarchs, political and religious leaders, state presidents, scientists, etc. –

giving rise to the idea that becoming the object of public gossip was equivalent to acquiring the same *social status* as a famous actor or politician (Marshall 2006; Street 2006; Eco 2007). This second stage took place fundamentally in the entertainment dimension, which confers upon it a logic of association between the contestant and his actions as a universal model, for the logic is 'if he exposes himself, anyone can do it' (Eco, 2007).

On the other hand National consumption of TV programming in Europe shows us that the great majority of fiction has become nationally produced, but at the same time markets are becomingly increasingly open to the combined offer of national, European, North and South American fiction lowering cultural barriers and promoting cultural exchange (Hesmondhalgh, 2007; Taplin, 2007). An example of blurring of borders and focus on reality formats has been the increasingly success of mystery and Sci-Fi series, but this time combining our daily life with supernatural (Lost, Supernatural, Medium, Invasion, etc). In what relates to the influence of changes in reserve social perception and fictional writing, we have witnessed the reworking of more traditional concepts as the one's portrayed in Desperate Housewife's, Grey's Anatomy, House or Prison Break. Those are examples of very traditional plots but that are being mixed with the open up of the privacy, or reserve, of human relations within a work environment, household environment or even between people subjected to extreme stress and so more bound to explore the extremes of human relationships. Formats are no longer just present in Docudramas, Docutainment or reality shows but now have reached comedy too, like for instance the programme Camera Café present in France, Italy, Portugal, Spain and Poland. Coaching concepts is another example of the blurring of borders between previous types of programming and the use of subjects related to the personal life that have gone beyond talk shows and into 'formats' built to coach people in health issues in programmes such as You are what you eat or the Biggest Looser aired in Channel 4, NBC, RTL or M6. Adding to all those new 'formats' we continue to witness the presence of reality shows, like Big Brother, now built around the celebrities and not just 'common ordinary people' (Giles, 2006). If reality shows were a first example of loss of reserve and blurring of borders as driving concepts of entertainment we know keep on watching innovations in this sector be it through the mix between sing and dance contests and reality shows, or through the talent shows aimed at Business, Fashion, Education, Boxing, Football or even dating shows (Ytreberg 2004; Turner 2006).

What we find in entertainment models today is an innovation promoted by a myriad of factors that combined a specific set of themes, ways to tell stories and types of fictional characters, together with multiple media environment networked by the plots, scripts and technology. That network combination allows, producers to build, and us to view, different angles of the same story, that is, the networking concept adapted to fiction and entertainment. But we cannot forget that the success behind reality TV, or coaching formats, owes a lot to the user's role. Participants in reality TV are, in fact, acting as users, innovating in the sense that it's their actions, their capability innovate in behaviours and actions, that are responsible for the success or failure of shows, very much the same way in which they are making Web 2.0 sites prosper or decay in their online social networking.

News is a central component of the media system and it would be difficult for us to imagine a world where we would no longer find the news at the newsagents, where we would not hear the news every half hour when we turn on the car radio, where we would not surf the Internet in search of a sports page when we arrive at work, where we

would not (occasionally) be tempted to go check the website of a newspaper to see if anything new has happened, or where, when we get home, there would not be one of those faces on the televisions screen that we have become so accustomed to watching at dinner time reading the news to us. News is part of our everyday life, so we do pay a certain amount of attention to it, even without such emotionally strong catastrophes such as the 9/11 disaster or the tsunami in South-east Asia in 2005 (Cardoso, 2007).

The main contemporary trends within news production in our societies are built around the idea of coexistence of different news models under a same time frame. Evolution in journalism has meant during the majority of the 20th century that we had a leading model for news production (Burgh, 2005, Shoemaker 2006). What we seem to be witnessing is a news environment where we find as many news production models and strategies as the possible audiences. So we have, as always, different approaches to news based on the medium used (radio, TV, newspaper or Internet) but also the need to differentiate the way news are built, sources are chosen and distribution channels are used in order to build many different audiences. At the same time, audiences network different media looking for more information on a given subject or simply choose different media for different news.

News has gone beyond dialectic between 'opinion news making' versus 'descriptive news making'. They have arrived at a stage where the multiplication of producers (journalists vs. non-journalist), together with a multiplication of news models (diversified in terms of perceived quality, quantity of news displayed, scope of the thematics chosen, types of sources) becomes the rule. The change in news is twofold driven, both by who writes them and who receives and searches for them, for both are subject to a media enriched environment. A media environment enriched, by the quantity of information available, the multiplication of interfaces and their networking. The fact is, that people are still looking for novelty and the truth but, they triangulate it between many different sources by making triangulation of journalist vs. citizen journalism or between journalist vs. journalist or, even, between citizen journalism vs. citizen journalism.

If we combine the practises of triangulation of news offers together with the differences in cultural identity, that have always been the trademark of journalism between different areas of the globe, we must acknowledge that the change we are witnessing in news production and availability owes as much to the change in boundaries and reserve as to the perception of otherness, the valorisation of interruption and the search for transcendence. Both newsmakers and newsreaders are faced, at the same time, with diversity of news models within their professional and national communities and also have been obliged to consider the existence of diversity in news production and news fruition around the world. That is the change: the networking concept that moulds the way we produce news and inform ourselves of novelty with accuracy.

The Networking of the new media system

On the basis of the developments here analysed its possible to argue that a new media system has slowly been establishing itself over the last decade and that the role of users in its shaping must be acknowledge. In the 1970s McLuhan argued that the media were the message (McLuhan, 1997), meaning that any single medium induces behaviours, creates psychological connections and shapes the mentality of the receiver, regardless of

the content that medium vehicles. Castells, in turn, characterised the organisational relation of the current media as being based on the 'message being the media' (Castells, 2000), i.e. the media are shaped depending on the message one is trying to get across, and seeking that which best serves the message and the audience at which it is aimed. But, not only have we evolved from a moment where 'the media were the message' into a society where we find the 'message being the media', we also are witnessing a moment when the channel or medium is no longer neutral with respect to what it vehicles. Furthermore, 'the media precede the message' (Eco, 2001) when the technological acceleration produces multiple new channels that exist before there is content to be placed there, creating a new challenge of an economic character, thus rendering transmission feasible without having equated what is to be transmitted (as in the case of interactive and digital television or the interactive CD-ROM). In addition to the economic challenge, we find also a cultural change that marks a new paradigm of communicative organisation. Such a paradigm is visible in the fact that the majority of the new communicational channels have been presented to the general public in a process of active experimentation which Castells has defined as 'learning by doing' (Castells, 2000) or the shaping of its own media environment by the audiences, and no longer only by the media companies. This cannot be seen as merely a conjuncture change in the mass media system. This new media system, whose consolidation phase took place between 1990 and 2001, is characterised by global changes in the communicational trends that have given rise to a new communicational model.

It has been argued in this paper that we have gone beyond a communication model based in mass communication and into a fourth model, a communication model based in networked communication.

Our society's communicational model is shaped by the combined leverage of world wide communicational globalisation processes, together with the networking of mass and interpersonal media by the media users and consequently, the rising of networked mediation. The organisation of uses and networking of media within this communicational model seems to be in direct connection with the different degrees of interactivity usage that our current media allow.

If we build communicational models in our societies it is also true that main *communicational paradigms* formats also what a given media system will be. Our communicational paradigms seem to be built around a rhetoric essentiality built on the importance of moving image, combined with the availability of new dynamics of accessibility to information, with new roles of innovation ascribed to users and with profound changes in news and entertainment models.

Our contents, be it news information or entertainment seem to have changed due to the increased presence of contents delivered by media users and not just media companies, giving rise to the coexistence of different news models for different audiences. Not only news information has changed but also entertainment. The innovation in entertainment models therefore is connected to the availability of user generated content but also to the changes brought by media companies, namely the search for new types of contents like the 'formats' and the experimentation with the erasure of boundaries between traditional programmes genres and new approaches to social values such as privacy, reserve, and changes in the realm of time, in the realm of space and in the realm of ethic, all of them reflected on the way stories are told and scripts written.

The communicational model generated in the informational societies, where the prevailing social organisation model is the network, is that of *networked communication*. A communicational model, that does not replace the previous models, but articulates them, producing new forms of communication and also enabling new forms of facilitation of individual empowerment and, consequently, communicative autonomy. In the Informational Societies, where the network is the central organisational feature, a new communicational model has been taking shape. A communicational model characterised by the fusion of interpersonal communication and mass communication, connecting audiences, broadcasters and publishers under a matrix networking media devices, ranging from newspapers to videogames and giving newly mediated roles to their users.

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CHAPTER 7

The challenge of user- & QoE-centric research and product development in today's ICT environment

Katrien De Moor and Lieven De Marez

Introduction

Literature that addresses the role and importance of the user in the domain of ICT development and innovation has been constantly increasing over the last few years. Some authors refer to it as a new field of study, uniting interdisciplinary insights and knowledge (social sciences, usability research, design, innovation studies, etc.) (Coombs et al., 2001; Haddon et al., 2005: 5). Research initiatives in this emerging field focus on a range of topics such as the diversity of approaches to involving users in technological development, the problems and limitations these approaches entail (e.g. lack of established practices for interdisciplinary cooperation, imaginative capacity of end-users), the possible roles of the user (e.g. user as 'innovator' or 'co-creator') and the search for adequate measurement tools and concepts. Given the broad range of topics, this chapter will restrict itself to one particular topic that has gained importance in development and innovation research, that of 'Quality of Experience' (also referred to as 'QoE').

The chapter is structured as follows. In order to set the context for subsequent discussions, section 1 is dedicated to a number of relevant developments, shifts and implications in the wider context of ICT consumption and production. Section 2 reflects on the altered roles for the end-user in this changed ICT environment. Drawing on both academic and non-academic sources, the third section introduces the concept Quality of Experience (QoE) and links it to the increased importance of the user. In section 4, two important challenges with reference to QoE are identified: some of the most essential concerns are discussed both on the level of conceptualisation - for which a conceptual model for QoE is presented - and on that of QoE measurement. Section 5 elaborates on some suggestions for tackling these challenges, and the last section indicates the way this chapter has contributed to the literature and reflects on challenges for further research.

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

In the current ICT environment, technology provides creators and consumers of content with a myriad of coding, security, access and distribution possibilities. Information and multimedia services can be accessed from almost anywhere at anytime. The era of growing 'convergence' (Van Cuilenburg, 1998: 12; Van Dijk, 1999: 9) gives the consumer the opportunity to choose from an overload of multi-featured devices (such as Apple's iPhone or Sony's Playstation 3) and new applications (e.g. mobile news).

From the suppliers' point of view however, innovation seems to be a paradox. Lennstrand (1998) aptly describes it by posing the question 'How come it goes so slowly when it goes so fast?' Liberalisation and growing convergence have resulted in a

rapidly changing, hypercompetitive ICT market, characterised by shorter product life-cycles and an evolution of 'always faster' (Dodgson, 2000:19; Haddon, 2004:1). Poiesz and Van Raaij (2002: 32) use the 'innovation spiral' concept to illustrate this increasing pace in the innovation process: due to hypercompetitiveness, all competitors feel a greater need for innovation in order to distinguish themselves. As a result, not only does the speed of innovation development increase, but also the number of attempts at innovation. In this proliferation of innovations, it has become very difficult for the consumer to distinguish one supplier from the others.

Paradoxically, in this evolution of always faster and shorter, the ICT environment is also characterised by a kind of 'slowness'. More and more innovations fail to 'pass the chasm' between innovators and some early adopters on the one hand and the rest of the market on the other (De Marez & Verleye, 2004: 33-34; Moore, 2002: 5-6). Explanations for this are usually sought in the skipping of user-centred research stages due to the shortening of development and product life-cycles, the absence of suitable methodologies and, consequently, the lack of accurate insight into the expectations and requirements of end users, especially in the *early development stages* (De Marez, 2006: 33-34). In some cases, the lack of such user insight resulted in an underestimation of an innovation's potential (e.g. 2G GSM) (Carayannis et al., 2003: 135); in other cases it lead to an overestimation of market potential (Punie, 2000: 280). However, in both cases the result is largely due to the lack of a clear and user-centred analysis of the market.

User at the forefront

It is increasingly being argued that the user has a crucial role to play in the process of ICT innovation and development: a thorough insight into the needs, requirements and expectations of the end user is crucial for the successful development and introduction of new technologies. With reference to this belief, a gradual shift has taken place in both theory and practice. From the early nineties on, both are characterised by an increased emphasis on the user and a gradual shift from a technology 'push' towards a more 'pull'-based and thus user-driven mentality (Rickards, 2003: 1095; Trott, 2003). From a theoretical point of view, the abovementioned evolution towards a more user-oriented paradigm seems to be influenced by rather untraditional approaches such as Von Hippel's 'Lead User Theory', stating that a particular group of users (i.e. 'lead users') can serve as a kind of 'need-forecasting laboratory for marketing research' (Von Hippel, 1986: 791).

Moreover, this ongoing shift from 'push' to 'pull' seems to be supported by authors from various fields: whereas Sanders (2001: 2) supports the need for a better understanding of the user in order to drive true innovation from the 'user's perspective', Munnecke and Van der Lugt (2006: 8) state that 'understanding user needs, context and experiences can ensure that offerings will resonate with consumers in the future.'

Having this broader context in mind, it is also relevant to reflect on this shift from the bottom-up user perspective. With respect to the purchaser and user of ICTs (the demand-side), it can be said that the abovementioned waves of liberalisation and convergence contributed to an enormous empowerment of the consumer, since consumers now have the (relative) power to choose between many alternatives. Today's reality is that the user has turned into a 'harder to please' (Kotler, 2003: 72) and self-conscious stakeholder. In the Web2.0 sphere for example (YouTube, blogging),

traditional consumers are increasingly transforming into content-producers and are now also referred to as 'prosumers' or 'produsers' (Toffler and Tromp, 1981). Further in this book, Picone (2007: 9) aptly describes these new user roles in his conceptualisation of online news use. Illustrations of these changing or 'blurring' roles of the user can be found on the industry side too: Microsoft provided its Xbox 360 'lead users' with developer kits; and Philips is using the 'lead user methodology' (see also Von Hippel, 1986) for beta-testing in its 'leaduser.nl' studies.

Each of these examples shows that the user of today's and tomorrow's technologies (and the idea of involving them) has started to assume importance in ICT development and innovation processes (Haddon et al., 2005: 233). Until now, however, these initiatives seem to have remained rather fragmented: user involvement is 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: 10; Mulder and Steen, 2005).

Turning now to a more theoretical framework, the abovementioned developments can be linked to some more generic views on technological development and adoption. When it comes to theories about technology adoption, diffusionism was a dominant paradigm for several decades (Rogers, 1995: 2003). Since the early nineties, more user-centred paradigms such as the 'Social Shaping of Technologies', 'Social Construction of Technology Approach' (SCOT) and 'Domestication' perspective (Silverstone and Haddon, 1992; Lievrouw, 2002: 185;) have gained more influence. Nowadays, a lot of authors find identify most with an 'interactionism' perspective (Rickards, 2003: 1095; Trott, 2003: 836), which explains technological development, adoption and diffusion as a continuous synergy between technological and user/societal forces. Or 'social shaping and diffusionism being so intimately tied that they should be seen as the two sides of the same innovation coin' (Boczkowski, 2004: 255).

With respect to the integration of the 'user' into the New Product Development (NPD) process, it is also relevant to consider some previously established traditions in various fields, such as Human Computer Interaction (HCI), User-Centred Design, participatory design, co-design and 'lead user innovation' (Lindgaard et al., 2006; Von Hippel, 2005). During the 70s and 80s, the emphasis in fields like HCI was usually on efficiency, functionality and the way people were thinking and processing information (Geerts, 2006; Tuomi, 2005: 21). From the late 80s and early 90s on, people were seen as social actors and the development team started to recognise the importance of social factors and dimensions. Nowadays, it can be said that technology is ubiquitous (in both the public and private spheres). More importance is thus attached to the people's home environment, social and contextual factors, emotions, experiences, etc. (Geerts, 2006). Despite the somehow differing methodologies and underlying assumptions, each of these traditions acknowledges the crucial role of the user in the process of shaping and transforming ICTs.

To summarise, over the last few years the ICT environment has been characterised by the growing number of attempts to make the process of developing and introducing new ICTs more 'user-centric', both in theory and practice. As a result, we are now faced with a broad scale of fragmented 'user-centric methodologies' and concepts. In the context of these developments, the 'Quality of Experience' concept has made a lot of headway. Hence, the following section surveys the rise of the QoE concept and explores how it is linked to the abovementioned evolution towards 'pull'- and user-driven strategies.

Quality of Experience: the new battleground?

Whereas 'Quality of Service' parameters and technical performance metrics received a lot of attention in the past, it can be argued that *Quality of Experience* is now the new 'magic word'. The growing interest in concepts like QoE and User Experience is believed to be closely related to the abovementioned shift from 'push' to 'pull'. Kumar (2005: 39) illustrates this aptly when he says: 'The consumer is king – and needs high QoE.' Following Pine and Gilmore's 'Experience Economy' (1999), experience seems to have become a USP or 'competitive battleground' (Kirsner, 1999: 1).

Some authors refer to a shift in value from 'products' to 'experiences' (Lawer, 2006). Referring back to the rise of the user/consumer as powerful stakeholder, they can now easily switch from one supplier to another when unsatisfied with the experience delivered. Purchase decisions are now increasingly based on the (perceived) Quality of Experience, while at the same time, from the user's point of view, concerns about the QoS delivered have become a non-issue (Van Moorsel, 2001: 8). In this respect, Jain (2004: 96-97) points out the difference between 'earlier adopters' and the 'mass market': the former will base their ICT purchases mainly on the technology, functionality and QoS of the product, whereas 'normal users care more about the problem the product solves and their experience while using it'.

Moreover, QoE is not only important for adoption purposes, it is at least as important for loyalty purposes: good experiences will promote customer satisfaction and customer loyalty (Kumar, 2005: 37). At the same time, having satisfied customers may enhance a positive market perception and prevent market dilution. All these elements can help the company to create a relative advantage and maintain its competitive edge (Nokia, 2004: 3). Furthermore, it is assumed that if companies deliver high QoE to their customers, the latter will be happy and satisfied (Nokia, 2004: 3). On the other hand, if this is not the case, a 'customer experience gap' (between what customers want and what they get) will arise (Good, 2001: 4). The existence of such a gap is usually attributed to a lack of insight into the full customer or user 'experience'. Developers, designers and managers often acknowledge its importance, but they still lack the necessary knowledge and tools to map QoE in a user-centred way. QoE is still often measured and studied from a rather confined and narrow perspective (instrumental, in terms of optimizing QoS etc.).

Although it is increasingly argued that the consumer and user should be more involved in the development process in order to anticipate what the user expects and experiences, various difficulties and questions regarding the role of the users (Cf. 'the dilemma of user involvement*'* in Limonard and De Koning (2005: 176)), the timing (early vs. later stages), appropriate tools and methods and types of users etc. (Haddon et al., 2005: 9-10) remain unsolved. In this respect it is relevant to refer to Von Hippel (1986: 791) 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' However, Von Hippel's theory is only one example.

These questions lead us to some of the most important concerns and challenges regarding QoE: how can good experiences be delivered? And how can end-users be closely involved in this process? Drogseth (2005: 61) describes the problem in terms of cognitive dissonance between the priorities of technology managers (QoE, user-centric approach) and what they actually do (QoS, technology-centric approach). Two of the main reasons for this 'discrepancy' are the lack of a concrete definition and clear

conceptualisation of the QoE-concept on the one hand and the lack of a good approach to measurement on the other hand.

Two challenges

In current practice, initiatives for QoE optimisation seem to be rather fragmented and lacking in the necessary insight into QoE as a multidimensional concept. A clear and detailed definition and conceptualisation of the QoE-concept is not available in the literature. Furthermore, the current approaches to the measurement of QoE seem to be neither very user-centric nor well-embedded in a synergetic and interactive process. Before taking up the measurement challenge, we will focus on the conceptualisation of QoE.

Challenge 1: QoE conceptualisation

In order to answer the questions *What is Quality of Experience*? *What distinguishes it from other related concepts*? and *What would a conceptual model of QoE look like?*, we draw on both a survey of the literature and consultation with an expert panel on QoE that took place in the context of a 3-year IBBT[1] project on E2E QoE[2]. Firstly, we studied QoE and its relation to other 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' we call Quality of Experience has only emerged since the late 90s, when end-users and their experiences and expectations became more important. 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. Only recently have the quality of users' experiences become more important. However, in definitions of QoE the narrow technological interpretation often remains quite explicit. Kumar (2005: 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 such as O'Neill (2002: 1) and Van Ewijk et al. (2006: 1) define QoE in a similar, rather narrow and QoS-like way.

Parallel with the rise of the user and traditions like HCI, the increasing popularity of the usability concept also found its way into definitions of QoE (e.g. Nokia, 2004; Alben 1996). Obviously, QoS and usability are key dimensions in the definition of Quality of Experience; but they cannot be the only ones. Several authors emphasise the 'multidimensional' character of QoE (Forlizzi and Batterbee, 2004; Gaggioli et al., 2003: 121; Kirsner, 1999: 1). Some stress the importance of the user's 'emotions, expectations, and the relationship to other people and the context of use' (Arhippainen, 2003: 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 and Van Der Veer, 2005: 1).

Numerous conclusions could be drawn from the desk research: QoE definitions are often 'too narrow' in terms of QoS and usability, and most authors agree on the

[1] IBBT is the Interdisciplinary Institute for BroadBand Technology, founded by the Flemish Government <www.ibbt.be>.
[2]< http://projects.ibbt.be/qoe>.

multidimensionality of the QoE concept although there remains much inconsistency at the level of the dimensions (and subdimensions) of QoE.

As mentioned before, we also consulted a panel of 12 national and international experts on QoE, who were willing to participate on the condition of anonymity. The literature, seminars and conferences were scanned in our efforts to put a panel together. People who had recently published on the QoE topic and practitioners involved in researching and managing QoE were considered as experts. The panel consisted of people with different backgrounds. Most experts were from the industry:

- Expert 1: Strategic Technologies Officer - Siemens (BE)
- Expert 2: Customer Experience Consultant - BT (UK)
- Expert 3: Higher Management - Enterprise Management Associates (US)
- Expert 4: Research Engineer – Alcatel (BE)
- Expert 5: Higher Management - Psytechnics (UK)
- Expert 6: Lead technologist 'wireless' - Agilent Technologies (UK)
- Expert 7: Usability Manager - Belgacom Skynet (BE)
- Expert 8: Global Best Practices Director - BMC Software (US)
- Expert 9: Senior Lecturer - University of Brighton (UK)
- Expert 10: Strategic Project Lead - Alcatel (BE)
- Expert 11: Middle Management - Televic (BE)
- Expert 12: Marketing Management – Customer Satisfaction: Siemens Mobile Networks (GER)

The panel was consulted by means of an online survey on QoE definitions and statements. An echo of the findings from the literature was found in our expert panel.[3]

To return to the question of how QoE should be approached, it is clear that QoE is more than just the 'instrumental QoS and technically inspired' concept it often is regarded as (McNamara and Kirakowski, 2005: 201). With input from both the desk research and the expert panel, we tried to build an integrated conceptual model covering the most important dimensions of QoE. This model is intended to serve as a basis for a new and approved measurement and optimisation approach. Starting from a model into 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.

(1) *Quality of Effectiveness (~QoS)* represents the traditional 'Quality of Service' approach to QoE. QoS does not equal QoE, but a performant technology or service is in most cases a first prerequisite to achieving it. This 'building block' is therefore all about accuracy and technological performance at four levels: a) application/service, b) server, c) network, d) device/handset.

(2) *Usability* is already integrated into many definitions of QoE. However, in most cases it is approached in terms of 'behavioural usability': focusing on ease of working, user-friendliness and man-machine interaction (Nokia, 2004: 3; Velthausz, 2005). The 'emotional usability' -- the user's emotions and feelings when using the device or technology – is often neglected (Gaggioli et al., 2003: 127).

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

(3) *Quality of Efficiency* 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. The central question here is: *Is the technology working well 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 may at the same time not be efficient enough to satisfy specific users or their expectations.

(4) *Expectations* are included in the conceptual model to enable adequate measurement of the previous subjective dimension (Quality of Efficiency). Only when you have an insight into the user's expectations can conclusions be drawn about whether a technology is working well or efficiently enough for that user. The degree to which the expectations are met will then determine the Quality of Efficiency.

(5) *Context* For a comprehensive approach to Quality of Experience, it is also necessary to consider the experience in its broader context. For this context variable, it is also 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.

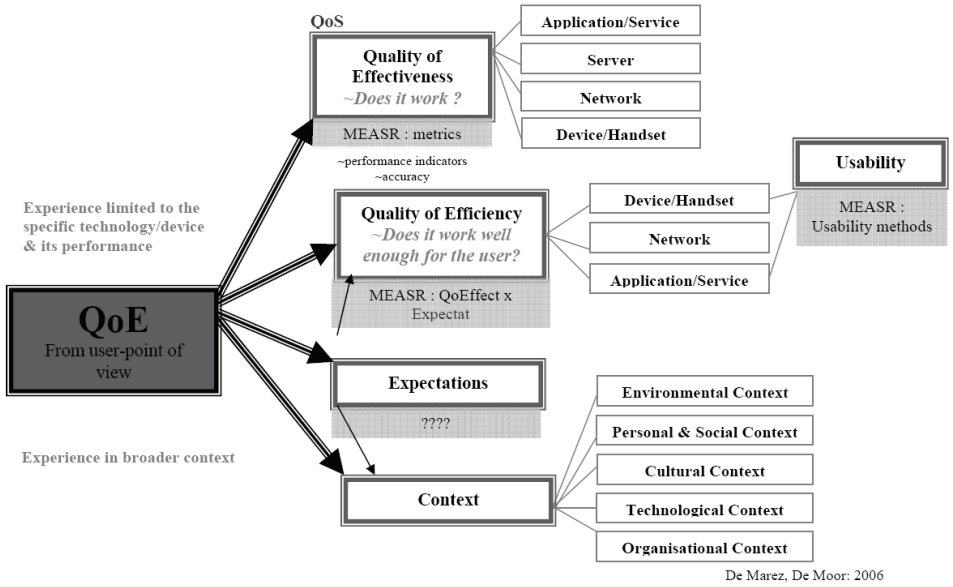

Figure 7.1

In short, the proposed model was thus constructed to cover not only what the technology does (QoS, performance measurement), but also what people do (and can do) with the technology, what people want/hope to do with it and expect from it, in what context people use it (or intend to use it), and to what degree it meets their expectations and results in 'end-user happiness'.

We identified a number of relevant 'subdimensions' for the building blocks Quality of Effectiveness, Quality of Efficiency and Context:

- Quality of Effectiveness:
  - *Application/Service:* functional effectiveness, content effectiveness, quality of sound/image, reliability, ...
  - *Server:* availability, reliability, ...
  - *Network:* connectivity/accessibility, reliability, packet loss, jitter (variantion delay, response time), latence, ...
  - *Device/Handset:* number of features, CPU usage, memory usage, ...

- Quality of Efficiency:
  - *Device/Handset: CPU, memory/memory errors, battery lifetime/energy consumption, screen/display, interface, personalisation, ...*
  - *Network: ease of access/availability, speed, security/fidelity/protection from itself or others, adaptivity, reconfigurability, interoperability, ...*
  - *Application/Service: response time, content personalisation, customisation, security (user authentification, protection, ...), navigational efficiency, complexity, content efficiency, attractiveness of content, ...*

- Context:
  - *Environmental Context: private/public environment, mobility, seamless handover, usage context, solo/simultaneous usage, ...*
  - *Personal and Social Context: personal social unit, network externalities, identity creation, community feeling, in group/out group communication, empowerment/enslavement, interaction, dependence/independence, self efficacy/competence, visibility, demonstrability, emotions (enjoyment, fun, frustration, ...), prior experience, ...*
  - *Cultural Context: age, continental/regional differences, values, traditions, ...*
  - *Technological Context: Simultaneous use over multiple devices, aesthetics, tangibles, compatibility with existing devices and networks, usage intensity and variety, trust, brand image, reliability, billing, cost, organisational support, ...*
  - *Organisational Context: procedures and protocols, ...*

With these 5 dimensions we aimed for completeness when it comes to the 'main building blocks', but, referring to the fact that QoE is really a subjective and 'open-ended' matter (Drogseth, 2005: 64), it is important to stress that the conceptual model cannot be considered to be exhaustive in terms of subdimensions.

Challenge 2: measurement of QoE

In an attempt to tackle the second challenge (measurement of QoE), a first step consisted of a literature survey of the state-of-the-art methods and practices for measuring QoE. According to Vyas and Van Der Veer (2005: 1) the 'era of user experience' has challenged designers and developers 'to understand human experiences and apply them to the design process'. Likewise, other authors emphasise the importance of thorough insight into end-users' experiences and expectations during the NPD process (Arhippainen, 2003: 2; Vuckovic and Stefanovic, 2006: 207).

In contrast to this conviction, a major issue in practice is the lack of user involvement that ensues from 'technological determinism.' The technological sky is the limit, and there is too often not enough concern about what end-users want. Developers often wrongly assume that new applications and so-called technical optimisation will self-evidently lead to a better experience. 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 ensure good Quality of Experience (Coninx et al., 2003: 17; Empirix, 2001). In other words 'it is no longer sufficient just to deliver products which have technical excellence' (Bevan, 1999: 89). Users should be involved throughout the whole development process (not only in the evaluation phases), and insight into users' expectations and requirements should even serve as a starting point for the development of a new product or application.

Secondly, as Quality of Experience is often given a narrow, technical and QoS-like interpretation, it is mainly measured in terms of technical metrics, and not as a multidimensional construct (Arhippainen, 2003: 3; Buchenau and Fulton Suri, 2000: 1; Gaggioli et al., 2003: 121). The measurement of 'subjective' dimensions of experience is often skipped or neglected because of shorter product life-cycles, the pressure of time, budgetary considerations, or simply because of ignorance (McNamara and Kirakowski, 2005: 201).

Turning now to the most important measurement concerns, the necessary knowledge of existing methodological tools (in terms of QoE measurement) is too often lacking. For those dimensions that are not measured in the current approach, a reorientation of existing methods and methodological renewal seems to needed. According to Kort et al. (2005: 1), the existing methods are not suited to gaining 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 look more broadly than just the performance and QoS aspects: it's about gaining an insight into what the user really experiences, from his own perspective.

Towards a new approach

The identification of the most important problems and issues concerning the measurement of Quality of Experience, brings us to a related crucial matter: *How should it be measured?*

As we have seen, QoE is a multidimensional concept consisting of five major building blocks, and 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 experiences changes over time because different contextual factors influence it' (Buchenau and Fulton Suri, 2000: 1). So every dimension of QoE should be measured!

Furthermore, the measurement of QoS and QoE traditionally takes place after the user experience. More stress should however be put on prior expectations. What is needed is a so-called 'predictive approach' that interacts with the user and focuses on their needs and experiences from the first stages of the NPD process onwards (Ishibashi and Tsykin, 2004: 135; Arhippainen and Tähti, 2003: 27). In this respect, it's also worth mentioning Raina (2006: 2): in his 'Customer Happiness Mantra', he emphasises how

important it is to have an insight into the user's expectations (Expectation of Quality, or EoQ). He argues that *EoQ=QoE*, or in other words that when the expectations equal the experience, your customer will be happy and satisfied. However, a problem that may arise in these early expectation measurements relates to what Limonard and de Koning (2005: 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' (cf. Von Hippel, 1986, 2005) might be very useful user-categories in overcoming these problems of familiarity and involvement.

Since the existing approaches to measurement and efforts to involve the user are too fragmented and not well integrated into the whole development process, the following section gives some guidelines for better measurement. Both the literature and the expert panel taught us that successful QoE measurement should be considered rather as a 'journey' than a 'destination' (Enterprise Management Associates, 2002: 3). Needs and expectations are influenced by several factors, so what is needed is a continuous, synergetic process consisting of several periods of interaction with users (Arhippainen and Tähti, 2003: 27; Corrie et al., 2003: 1).

The general flow is usually divided into several stages, each raising other questions and requiring other methods to gain the necessary insights. Inspired by other authors who opt for a phased approach (Lindgaard et al. 2006: 48; Velthausz, 2005: 48), we prefer the following stages of the NPD process: 1. prior-to-development and prior-to-launch, 2. post-development and prior-to-launch, 3. post-development and post-launch. These phases, in combination with the main dimensions of the QoE conceptual model, are used as a basis for establishing a more user- and QoE-driven measurement flow.

In this respect, it is important to note that every phase in this sort of QoE flow will require a different type of user involvement and different methods. In the earliest and most generative phases ('fuzzy front end'), the emphasis will be on end-user expectations: what does the user expect and how can a certain technology be developed in such a way that it fits users' needs? What are important context variables and more personal, societal, cultural and other issues that need to be taken into account? Moving on to the second phase, in most cases the focus will be on the usability testing of early prototypes in close interaction with the envisioned end user. To this end, user requirements and expectations will need to be carefully 'translated' into technical requirements. The third phase is usually dedicated to the traditional post- and satisfaction measurements. In this phase it is crucial to map users' perceived Quality of Experience and to compare it to the pre-development expectation measurements.

In the scope of this chapter, we have limited ourselves to an exploration of state-of-the-art approaches to the measurement of QoE and some suggestions as to how to tackle the most important concerns. It is however worth mentioning that part of our research in the abovementioned IBBT project on E2E QoE consisted of a critical screening of methods and tools from various fields with the aim of integrating them into a QoE measurement matrix. The screening was based on the literature, consultation with methodological experts and our own empirical research. Our final aim is to make a relevant contribution to state-of-the-art QoE measurement practices by indicating which methods are best suited to each particular phase, by identifying methodological gaps and by proposing a toolset for user-centric QoE measurement.

Conclusion

This chapter focuses on the Quality of Experience concept in the broader context of a changed ICT environment and the changing roles of users within that environment. Two major challenges were identified with regard to QoE. Firstly, we went into the question *What is QoE* and tried to meet the deficiency of a conceptual presentation of QoE by presenting a multidimensional QoE model comprising five major building blocks. With the latter we hope to have provided a valuable basis for improved QoE measurement.

Since it is argued in the literature that there is a lack of good approaches to measurement, we were also interested in the challenge of QoE measurement. To this end, the most important concerns about the state-of-the-art measurement tradition were investigated, and some relevant suggestions for new approaches were explored. We argued that QoE should be measured as a multidimensional concept, and that it should see it as a continuous, synergetic process consisting of several periods of interaction with end users. Users' expectations, needs, experiences and so on can only be taken into account in the development process if they involved throughout. As the current efforts of such big players as Philips and Microsoft illustrate, it is clear that innovators and lead users can have an important role to play. However, these initiatives are still too fragmented as they are often not integrated into a whole, continuous, user-centred development process. Another concern is that often only certain types of users are involved (e.g. lead users, innovators).

Moreover, establishing insightful measurement practices also requires a selection and evaluation of methodological tools on the basis of their applicability (to certain phases and contexts), strengths and weaknesses. In this context it will be important to renew, test and validate some of the existing methodological tools in order to make them more robust and better suited to QoE measurement. This is certainly the starting point for our own ongoing methodological research on QoE, but we hope it is also a useful suggestion for other multidisciplinary research. In the end this must lead to a new QoE-centric approach that acknowledges the importance and changed role of one of the most crucial stakeholders, the user.

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CHAPTER 8

Social learning and intermediaries: Charting the mediators between developers and users of new ICT

James Stewart and Sampsa Hyysalo

Introduction

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 (Russell and Williams, 2002; Williams et al., 2005).

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 in this chapter we focus on *innovation* intermediaries and roles they play in social learning processes between production and use as they create spaces and opportunities for appropriation and generation of technical or cultural products by others.

Research on intermediary organisations in innovation such as consultants and other technology brokers began to grow during the early 1990s (Bessant and Rush, 1995; Hargadon and 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 and Rosenberg, 1986; Williams and Edge, 1996; Van de Ven et al., 1999). The changes in the models were spurred by increasing flow of findings about user initiated innovation (e.g. Pavitt, 1984; Von Hippel, 1988) and the continued innovation in use (e.g. Gardiner and Rothwell, 1985). The then relatively new and rapidly evolving fields of robotics and computerised manufacturing technology showed that talk of diffusion of generic systems matched poorly the extensive adaptations and further developments done by adopter organisations (Fleck, 1988; Bessant and Rush, 1995). 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.

There is a range of literature that documents the various intermediary organisations (various consultancies, state research centres et cetera) and the roles they play in innovation management (e.g. Hardagon and Sutton, 1997; McEvily and Zaheer,

1999), in literature on innovation systems (e.g. Stankiewicz, 1995), and in science and technology studies (Proctor and Williams, 1996; Van der Meulen and Rip, 1998; Callon et al., 2002). Diffusion studies have stressed the importance of change agents and opinion leaders in the diffusion of innovation (Attewell, 1992; Rogers, 2003) and after the late 1980s began to emphasise the work and re-innovations these actors do in tailoring and adjusting the innovation to different audiences (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.

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. 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, the roles they play in mediating design and use and how they affect the shape of new technology. The thrust of our argument is that the lack of appropriate intermediaries can severely impede successful innovation.

Social Learning in Innovation

Social learning in Innovation is a concept developed within the tradition of 'social shaping of technology' approach (Williams and Edge, 1996; MacKenzie and Wajcman, 1985) which views development of new technology as an uncertain process, characterised by complexity, contingency and choice (Williams and Edge, 1996). It places particular design episodes within multiple, overlapping cycles of development and implementation (Rip et al., 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 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

[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.

institutional learning and forgetting that occur across a constantly changing network of actors.

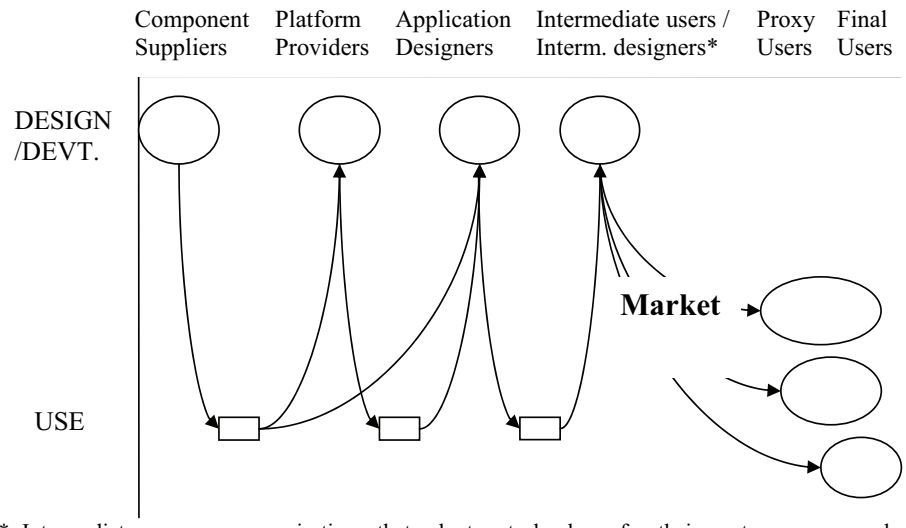
To understand these processes the Social Learning approach focuses on phenomena discussed under a range of generic mechanisms: learning-by-doing and using in the often trial and error processes of appropriating new technologies (Arrow, 1962; Rosenberg, 1982); learning by interacting (Lundvall, 1988; Cornish, 1997), as new technologies bring diverse networks of players together; and learning by regulating (Sørensen, 1996), as particular players attempt to assert their power though non-technical rules and regulations shaping the 'rules of the game' from everyday use to state policy. These mechanisms -or rather the more detailed learning dynamics that comprise 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 and Williams, 2002; Hyysalo, 2004). 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 a myriad of the participants, and continues though-out a project and over generations of product development. Many different users: intermediary users, end users and proxy users (few selected users that act to represent the rest of the 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 in 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

There are important differences in innovation spaces and degrees of freedom actors have to exercise choice, or act reflexively (Bessant, 1991). 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. Each member of a supply chain can be regarded as an intermediary between the preceding and following player, and end users only have contact with the final player in the chain.



* Intermediate users are organisations 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.

Figure 8.1: Pipeline linear development and diffusion.[2]

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 and 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.

[2] This and all below figures on innovation contexts are adapted from those presented in Williams et al. (2005).

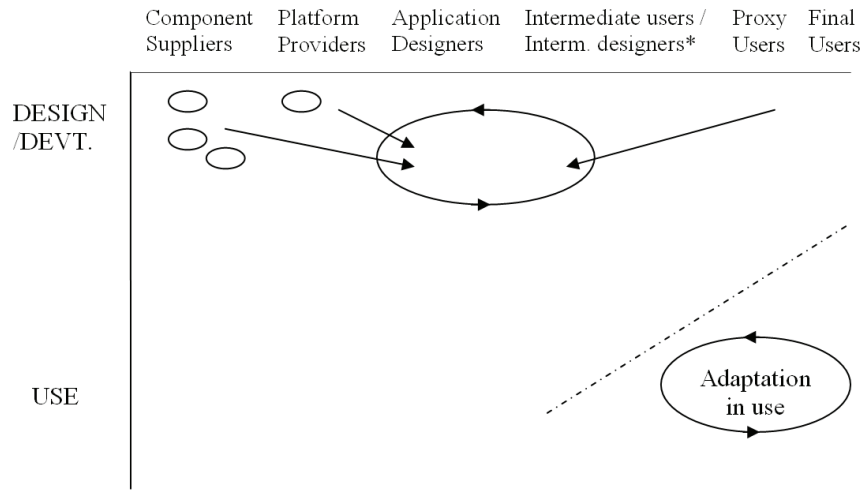


Figure 8.2: User centred design. A more dedicated application is built with the help of proxy users.

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.

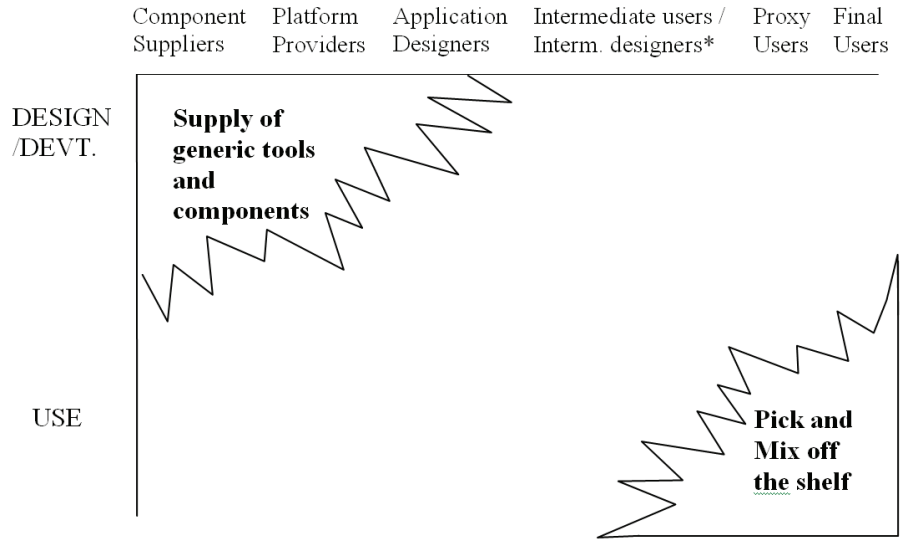


Figure 8.3: Pick'n Mix model where there are large clusters of generic offers at the supply end and the configuration of off-the-shelf components at local user sites.

The ‘pick and mix’ model is closest to the market model that actually could found in this extensive study. In this model 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.

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 and 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 Lieshout et al., 2001)

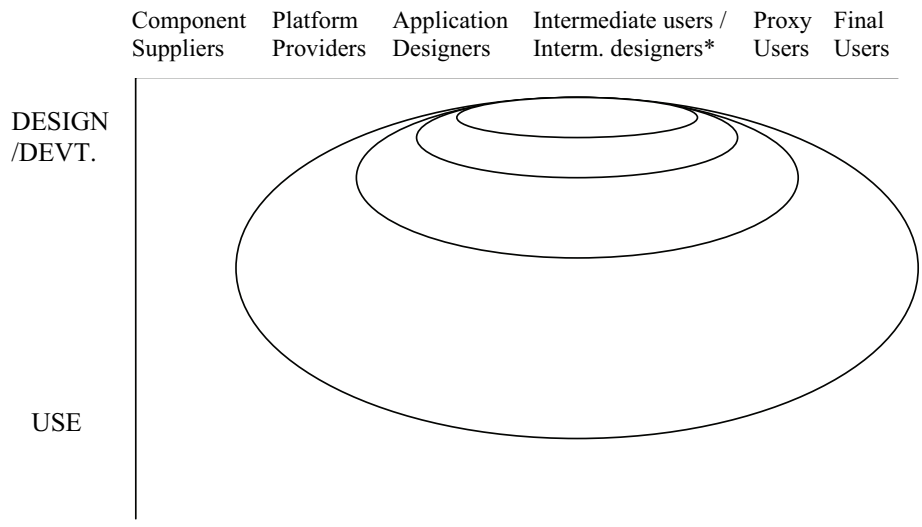


Figure 8.4: Technology experiment / evolving co-design project

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.

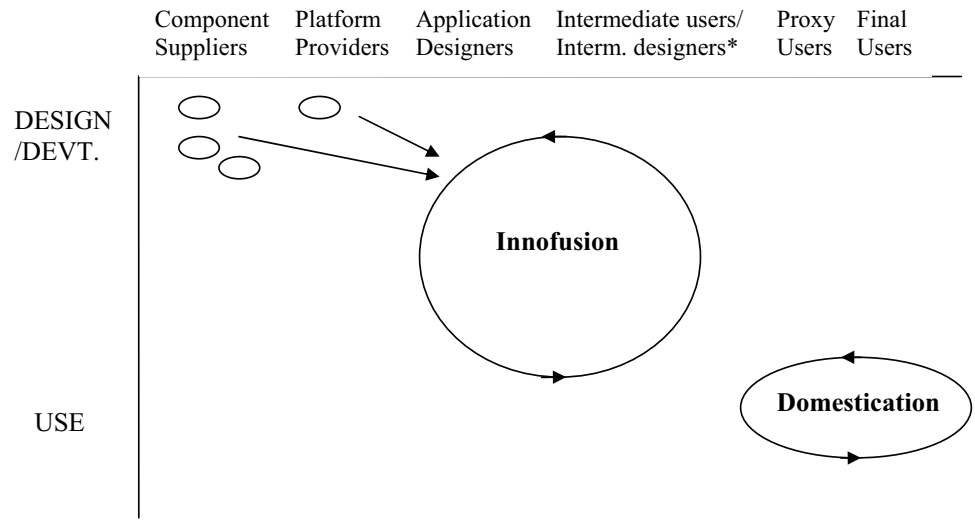


Figure 8.5: Innofusion and domestication model

Innovation is seldom confined to one of theses modes, but over time a particular project, technology and related 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 an impressive list of intermediaries can be found in most industries, the established intermediaries can turn out to be inadequate for doing the kind of job particular supplier and prospective users need. They mediate only some of the facets of between development and use, or the ways they mediate no longer fits the new products or new audiences. Let us tentatively sketch some typical intermediaries and their position between supply and use.

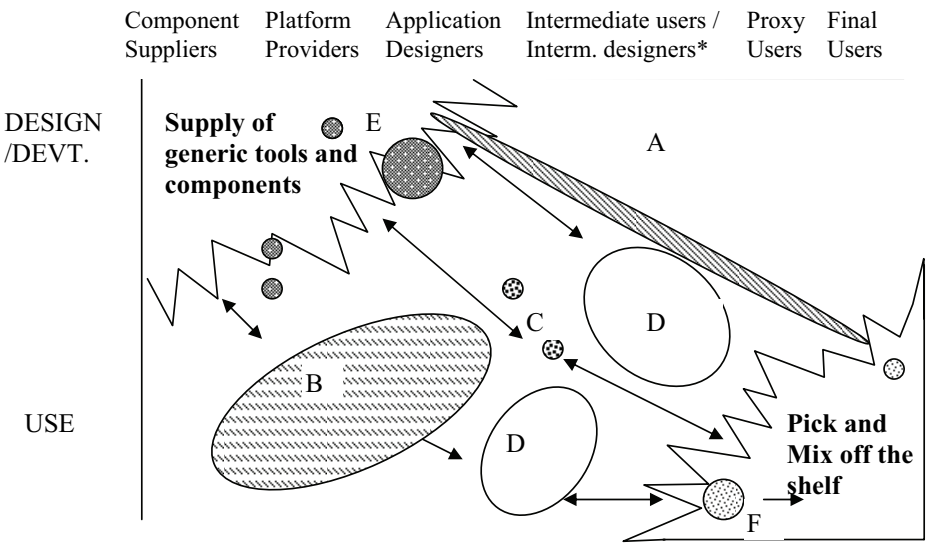


Figure 8.6: The niches of some common types of intermediaries illustrated in pick 'n mix constellation

Figure 8.6 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). However, the 'width' of their mediation thus tends to remain narrow, unless their task description gets expanded to include other tasks, such as user-training (Hyysalo, 2004).

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. Bessant and Rush, 1995; Van der Meulen and Rip, 1998; Howells, 2006). 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 favours or side-jobs 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 and Bodger, 1994) remain absent from technology management volumes that abound with literature on product champions, business angels etc. at the supply end.

The asymmetric distribution of knowledge amongst actors results in that people and organisations 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 our studies (Lehenkari and Hyysalo, 2003; Hyysalo, 2004; Stewart, 2007) it also became clear that 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 and whether it pays them to continue these tasks or drop them or shift elsewhere as is common in ICT business.

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 (Bessant and Rush, 1995; Hardagon and Sutton, 1997; Howells, 2006). 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 though 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.

These typologies of functions and activities of intermediaries approximate the generic terrain of intermediaries in social learning. However, as Bessant and Rush (1995) 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. 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 people whose actions are mediated by them.

Intermediary functions (Howells, 2006)	**Bridging activities** (Bessant and 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, organisational development
7. Validation and regulation	
8. Protecting the results	
9. Commercialisation	
10. Evaluation of outcomes	

Table 8.1: Functions and Activities of Intermediaries

When we 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 in the social learning processes between supply and use (Stewart, 2000). **Facilitating** can be described as providing opportunities to others 'creating space', by providing knowledge, gathering and distributing resources, and influencing regulations. The creation of the space that facilitates appropriation by others and the influencing of the perceptions and goals of sponsors and users involves active processes of **configuration** of people, technologies, relationships and meanings though 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. The third generic activity of intermediaries in social learning processes is **brokering**. 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, defending the spaces they have created, and their position in new networks of value.

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 organisations 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 try 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

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 organisation. Their work relies also on other intermediaries, such as offers of operators, specialist magazines, web-pages, et cetera. Some of these actions tend translate also into supplier offerings, albeit through an indirect and complex paths.
In performing their intermediary roles, these actors are engaged in what could be characterised as '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.

It is crucial to recognise that 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 (Stewart, 2004). Such framing is not limited to mere sales arguments or other 'wrapping' but tends to cut into features, functionalities and look of the product.

Contested framings: the 'user' and 'technology' as currency

More complexity occurs due to uncertainty regarding markets and users' preferences for future technological options (Hyysalo, 2003; Williams et al., 2005). 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. However, because many of these images - from newspapers, policy documents, consultancy reports et cetera - 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.

As a consequence, various trials, pilots and demonstrations become to have strong rhetorical value for different parties arguing their case and relevance. 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 'realise' 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 characterised 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 emphasises the acts in facilitating, configuring and brokering that different intermediaries do during the innovation process.

Conclusions

What we attempt to point out, and provide tools to address, is the important role of the actors that link the activities and innovations of end users to those of the institutions that professionally focus on developing new technologies and services. The Social Learning model of innovation makes clear that interactions between suppliers and users are crucial to successful innovation, but it is clear from empirical study that this does not happen automatically. Users and producers are generally unable to interact directly. Intermediaries of various sorts exist or are created to bridge the gaps between the local setting of users and producers. It is particularly important to recognise how intermediaries emerge from communities of users, and support and represent them, and understand how they can be supported themselves, and their value in the innovation process.

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CHAPTER 9

Archetypical users as starting point for exploring wireless city applications: Linking the domestication and diffusion approach

Jo Pierson, An Jacobs and Lieven De Marez

Introduction

An increasing number of services and applications are being developed and marketed within the emerging mobile and wireless environment. Former experiences with unsuccessful technologies - like WAP and MMS - have demonstrated that user-oriented approaches are required to investigate people's needs and context before or in parallel with the development of new applications. For this an interdisciplinary approach on user perspectives is required.

Traditionally academic user oriented research is situated in three different domains: that of human-computer interaction research, the social shaping approach and the adoption/ diffusion tradition (Frissen and Pierson, 2004). These three perspectives are beginning to share common approaches and methods. For example the typical HCI perspective of cognitive psychology has broadened its approach with theories from the social arena, like sociology, anthropology and other social sciences (Rogers, 2004; Clemmensen, 2004). Within the social shaping and ethnographic approach different methods of cultural and technological probing are being introduced to gather richer insights (Pierson et al., 2006). To date diffusion and domestication perspectives are too often considered as opposite and competing perspectives (Boczkowski, 2004: 255). With diffusionism as the more quantitative research tradition with the focus on acceptance and adoption decisions, and domestication as the more qualitative research tradition with the focus on the use and appropriation of technologies, both traditions could be complementary (Punie, 2000).

In this chapter, we elaborate such a combined method for identifying user-oriented wireless city applications in the early stages of service development. We report on the experiences of the enrichment of the social shaping perspective, more in particular the domestication school, with the adoption/diffusion perspective. In this way we interpret the design of technological innovations as a continuous and interdependent process of influence between technology push and user initiatives (De Marez, 2006: 259), or as 'two sides of the same innovation coin' (Boczkowski, 2004: 255).

Together with describing the method, we also report on the outcomes indicating the characteristics and types of applications. The outcome of both bottom-up investigations (domestication and diffusionism) served as feedback for the applications ideas, leading to design suggestions based on what potential users say, do and experience in everyday life situations in the city. This fits in the current evolution to increasingly involving the user in service innovation, especially in the 'fuzzy front end' of the new product development process.

To illustrate the combined approach we first situate the ROMAS project on which the insights are built for exploring and designing wireless broadband applications in a city environment. Secondly, we explain the process and the outcome of the archetypal

user approach and demonstrate the value of the domestication framework. Next, we illustrate the process and the outcome of the diffusionist research as applied in the project. In this way we want to show how they are indeed two sides of the same coin, taking care of data with their own procedures.

Research set-up

The methodological and empirical findings are based on the two-year ROMAS project (Research On Mobile Applications and Services) conducted by the research centres of IBBT (Interdisciplinary institute for BroadBand Technology). This chapter is based on research of the first phase (September 2006 until February 2007). The overall project objective is to conduct a user-oriented assessment of (future) wireless applications within a large-scale living lab environment from an interdisciplinary approach during the conceptual phase of the development. The living lab is an 'experimental field' of a socio-technological scope with specific goals and a specific structure, but simultaneously dealing with the uncontrollable dynamics of everyday life (Pierson and Lievens, 2005). In ROMAS, this refers to the i-City living lab in the city of Hasselt (Flanders - Belgium), where users are studied in real life. This environment consists of more than 600 users, equipped with a mobile device (PDA) running on a city services software platform, which enables a range of dedicated mobile applications. In the ROMAS project, different versions of wireless applications are being tested and evaluated in terms of their social value, market relevance, legal preconditions, usability and interface requirements, as well as quality of experience performances within the i-City living lab.

Archetypal user research within a domestication framework

The overall goal of the first stage in the project was to generate ideas, a prospectus of relevant and user-oriented wireless city applications. One way of doing so is to make use of social-scientific and ethnographic research in the early stages of new product development. A number of ICT companies have already adopted this kind of approach in their innovation processes.[1] In order to achieve this from a domestication perspective, we worked in an explorative way, which helped us to anticipate the domestication paths of these applications and to ground them in the actual everyday city life experiences and practices of inhabitants. The main goal is to identify the situational dimensions that are related to the city life of people - more in particular the practice of 'going into town' - and the mobile city applications under development. This outcome is taken into account for the creation of scenarios and personas, as an essential input for the subsequent phases of the development process (Jacobs et al., 2007). We focus on people's current practices and explore the implications on future practices of potential mobile city applications.

The domestication framework

The domestication perspective offers a framework for looking at the meaning and experiences of technologies in the everyday life of users (Haddon, 2007; Silverstone and Haddon, 1996). The concept, originating from anthropology, consumption studies

[1] Well-known examples of companies are Philips, Microsoft, Intel, Google, Motorola or Nokia. One of the meetings where anthropologists and social scientists involved in this kind of innovation strategic research and development gather is the yearly Ethnographic Practices in Industry Conference (EPIC).

and media studies, starts from the context in which ICTs are experienced. It refers to the integration of technology in the daily patterns, structures and values of users. It also refers to the activity of domesticating or taming wild animals to become pets, a metaphor for absorbing a strange technology into the context of the everyday life. This kind of research is essentially based on qualitative research methods, since the aim is to gain insight into the contextualised current behaviour and experiences of users, as well as into the interest for and the meaning of new devices and applications to people (Van den Broeck et al, 2006; Haddon, 2007). Central is the 'mutual shaping' or mutual dependency between technology and social change, whereby technology influences the everyday life and everyday use transforms the technology.

Within this framework we adopt an ethnographic research approach, referring to a analytical model and the matching set of methods that aims at perceiving the world from a perspective of the people one is seeking to understand ('verstehen'). More in particular, we aim at doing design ethnography in very early stages of the new product development process (Haddon and Paul 2001; Crabtree and Rodden, 2002).

Archetypal user research: selection of archetypes

To this end, we set up an 'archetypal user research' process, in which we explicitly formulate our expectations and assumptions respecting the user characteristics in relation to domesticating the technology that is being developed. This yields a pre-categorisation for selecting respondents, based on literature, former studies and analytical insights into the culture and structure under study. These assumptions can then - later on in the research - be questioned, by investigating the everyday life of the respondents in a multi-method and ethnographic way. In the end we find a new - more interpretatively grounded - categorisation of the previewed habitualisation of the technologies to be developed.

To organise purposeful sampling (Sandelowski, 1995), we first selected typical central social characteristics for explaining social change with regard to communication and media use in everyday life (age, gender, employment and life stages). Additional characteristics for the sampling were derived from the applications under study within the project: a mobile local news application and a mobile city guide application. In order to direct our pre-categorisation, we translated the affordances[2] of the two applications into two more abstract characteristics. Those characteristics referred on the one hand to searching and finding news and information linked to the city, and on the other hand to the different ways inhabitants (and not so much tourists) move around in the city. By focussing on inhabitants and not on tourists we could expect a higher variation in degree of familiarity with the city. Moreover, the different gradations of familiarity with the city determine the need for more or less information while moving through the city. Although the scope of this research was explorative, a certain amount of attention could thus also be given to the applications under development during the selection phase.

In the end, after fine-tuning the sample during the research, a total of eight archetypal users of wireless city applications remained, all with strong connections with

[2] Affordances are 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: 95). A term borrowed from Gibson's ecological theory of perception (1977).

the mid-sized Belgian city of Hasselt: a retired inhabitant, politician[3], city guide, home nurse, shopper, student living in a student house in the city, working man, and a working woman with children. All were interested to varying degrees in different kinds of city news and information, and they all moved through the city in various ways. The selected archetypes were distributed over the different quadrants in a matrix (Figure 9.1).

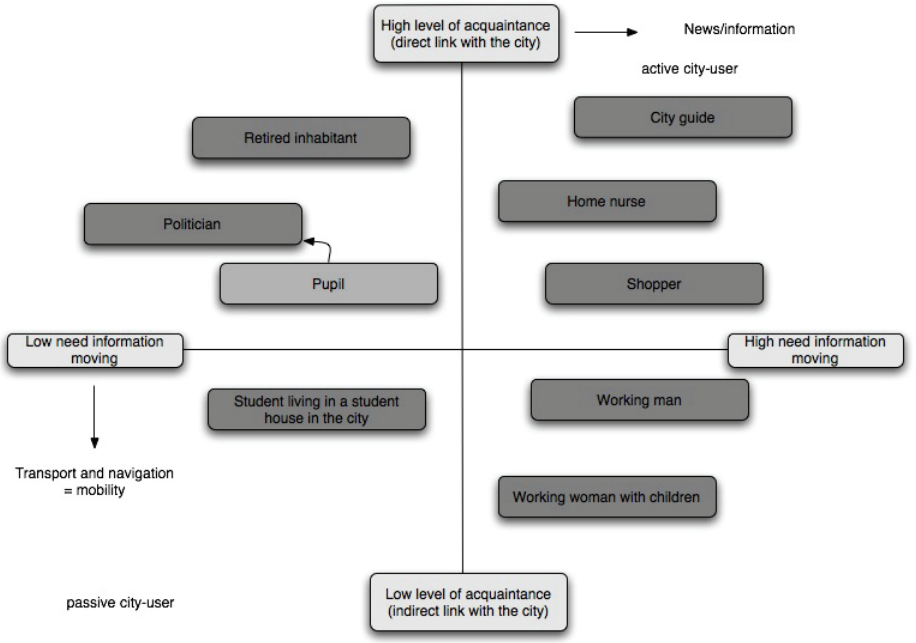

Figure 9.1: Matrix of archetypes

After the selection, a representative of each archetype was recruited. He or she was the subject of a field study, based on in-depth interviews and complementary ethnographic methods (observation, diary method, cultural probes and photo elicitation) in order to collect as much contextual information as possible. The goal was to identify the applications and functions within the digital city environment, which best fit the context of the archetype's everyday life environment. The latter can - dependent on the kind of application - refer to daily activities, such as listening to music, contacting local government, contacting friends in their online community, looking for the latest local news items etc. This analysis of the social context of the archetypal users will, however, focus on his or her mobile behaviour, in order to identify instances when wireless applications are meaningful.

[3] The archetypal user of the 'pupil' replaced by the 'politician' after a first iteration in the research, because there was a better connection with the characteristics for the sampling.

Archetypal user research: typology of 'going into town'

The research generated a 'thick' description of how the practice of 'going into town' takes form, among the different archetypal users. In the results, we first identified the kinds of activities that typically take place in relation to a common visit to the city of Hasselt, where the field study took place. Next, we took a closer look at the ways the city is visited during these activities by inhabitants and the dimensions that configure the different experiences. Finally, we looked at the reasons for doing different activities in the city. We found that 'going into town' could be the subject of a broad variety of activities, yet experienced in diverse ways. The city is experienced as an *in-between phase*, since a great amount of activities occur when a person is moving or on the go (Paulos et al., 2004). The city is both used for relaxation purposes[4] as well as utilitarian activities.[5] Most importantly, the stories support the idea that any fixed classification is inadequate, since activities are often hybrid: a utilitarian activity can be at the same time relaxing or vice versa.[6] Utilitarian activities frequently occur while en route, with a view to getting these activities done and over with as quickly as possible. Nevertheless, the city is also a place where people go to perform an activity at a fixed location. This type of activity is referred as a nomadic one.

Based on the project findings a dynamic typology of city visitors has been compiled. It is dynamic, since people can assume different roles while going into town, based on the aforementioned dimensions. The different roles are positioned on two axes: one refers to the kind of information source (official versus informal); the second to what extent the city visit is structured in time and place. This leads to the following figure.

This typology broadly identifies seven different roles, which a person can assume when going into town. Each role can lead to specific requirements for designing wireless city applications.

- *Planner*: A planner is someone who will structure his/her activity by means of information from official sources, e.g. a municipal website of a tourist office. He or she will carefully prepare the activity, which will increase the structuring in time and places to visit.
- *'On-hearsay' planner*: A person in this role will also structure his/her activity (in time and/or place), but will make use of another kind of information. He or she is more likely to heed the advice provided during social contacts with family, friends or acquaintances. This information can also be gathered from online social networks.
- *Planner (with foreknowledge)*: This role will also lead to the practice being well structured in time and place, but this structuring will not be based on clearly defined outside information. Here, the person already has a certain amount of foreknowledge due to regular visits or to being a long-time resident.
- *Organised explorer*: Although the organised explorer does not structure the practice, he or she will search out the official information in advance. For example, he or she

[4] E.g. Window shopping, going out, dining in a restaurant,…
[5] E.g. Shopping for food, doing payments at the bank, bringing in laundry,…
[6] E.g. Shopping at the market, bringing books back to the library and reading a magazine there,…

will check out a map, but will not use it to plan a specific route or for timing purposes, in order to preserve some degree of sufficient freedom.

– *'On-hearsay' explorer*: In this role, the person does not attempt to structure the activity, but will to some extent make sure to remain informed via the non-official information channels (offline and/or online social network contacts).

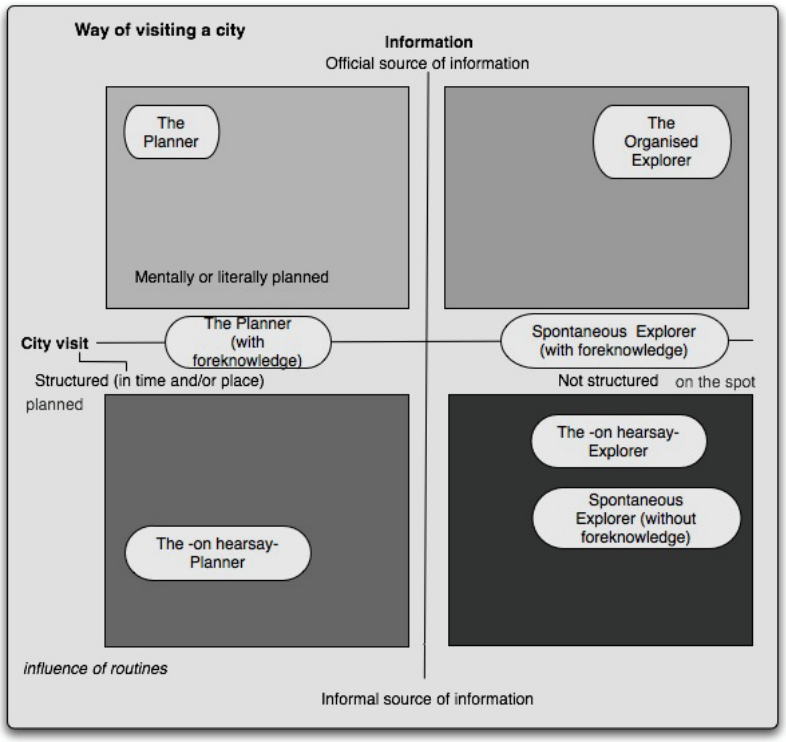

Figure 9.2: Typology of roles in the practice of 'going into town'

– *Spontaneous explorer* (with foreknowledge): Spontaneous explorers neither structure their activity nor look op information, because they are already informed. They avoid alien places, preferring to explore well-known localities.

– *Spontaneous explorer* (without foreknowledge): The practice, for these persons, is spontaneous, wholly without structure. They decide on the spot where and when to go in the city. They want to keep their independence, without being hindered in their choice.

Archetypal user research: recommendations for technology design

Finally, we also looked at the underlying dimensions for different activities, linking different roles linked to various dimensions. These main dimensions are the need for (utilitarian) information, fun and relaxation, sociality, efficiency and convenience.

These results, together with the former findings, were integrated in a number of general technology design recommendations:

- People are often on the go when performing utilitarian activities that they want to end as quickly as possible. Hence, here is an area of opportunity for mobile services, depending on the type and situation of the activity concerned. Some utilitarian activities are better suited for the use of a desktop computer, for instance online banking, than for mobile services.
- People spend a lot of time in the city. However, according to the literature, cities have few places for meaningful social contacts, the so-called *Third places* (Oldenburg and Brisset, 1982). This was also noticeable during the study. An important and social function of mobile devices might therefore become the stimulation of social contacts.
- The perception of a city is often closely connected with busyness. Encountering trusted people (like friends or acquaintances) is perceived as difficult. Mobile services that simplify this process will find a positive approval among certain users. This is not necessary valid for everyone: it depends whether the situation demands an online or real life social experience. Since the dimension of place has an important function in a city, the development of mobile services as a means for real life encounters in specific kinds of situations is to be recommended.
- A city is also important for offering room for several relaxing activities. It can, in itself, also function as a leisurely activity. The potential of mobile applications lies in the fact that they can inform people and thus help in making the activity as relaxing as possible, for instance with regard to navigation and transport.
- Although every person has different needs for (contextualised) information, mobile city applications can especially offer added value in the field of utilitarian activities and the practical organisation of everyday life; for instance a parking application, bus navigation application, best deal finder, city information application (possibly with integration of user generated content), event application (mobile programme guide).

These were the recommendations formulated on the basis of the research results gathered from within a domestication perspective. Let us now look at the other side of the coin.

Two sides of the same coin: enrichment from a diffusionist perspective

In the previous section, we presented a number of recommendations derived from the archetypal user research carried out within the perspective of a domestication framework. On the basis of an explorative study, the following section will examine the enrichment from an adoption and diffusion perspective, as applied within the project. First, a brief introductory overview of this theoretical perspective is offered.

Diffusion perspective

According to this framework, the diffusion of innovations in a social system always follows a bell-shaped normal distribution, in which can be successively distinguished between innovators (2.5%), early adopters (13%), early majority (34%), late majority (34%) and laggards (Rogers, 2003: 298). These segments are distinguished on the

timing of adoption decisions of the members of a social system (Rogers, 2003: 297; Trujilo, 2003: 2).

A person's innovativeness or '*degree to which an (s)he is relatively earlier in adopting an innovation than other members of the social system'* (Rogers, 1983: 22) is assumed to be determined by the perception of the following set of innovation characteristics:

- Relative Advantage or the degree to which an innovation is perceived as better than the successors or alternatives (e.g. Rogers, 1983: 3)
- Complexity or the degree to which an innovation is perceived as relatively difficult to understand and use' (e.g. Rogers, 2003: 266)
- Compatibility or the degree up to which the innovation is perceived to be compatible with a person's lifestyle and technologies (e.g. Lin, 2003: 354)
- Trialability or the degree to which an innovation may be experimented with on a limited basis' (e.g. Rogers, 2003: 266)
- Observability or the degree to which the results of an innovation are visible to others (e.g. Rogers, 2003: 266).

During the past decades, the theory and its assumptions served as a valuable basis for user-centric research purposes in multiple studies. In some cases the typical innovator and early adopter profiles have been used to select the so-called 'lead users', in other cases the assumptions on adopter profiles, segment sizes and determining perceptions of product characteristics have been used to detect the different adopter segments in order to investigate their needs and wants (e.g. innovativeness scales by Goldsmith and Hofacker, 1991; Moore and Benbasat, 1991 or Parasuraman and Colby, 2001).

Enriched by the diffusion perspective: broadening the set of potential mobile city applications

From the outset of this i-City living lab environment, several mobile city application(s) (ideas) had been developed and implemented (e.g. mobile news portal, mobile city guide). Since engineering and development departments are often susceptible to 'field of dreams thinking' (Baldwin et al., 1996: 190) or the 'if we build it, they will come'-virus (Dholakia et al., 1996: 3; Lennstrand, 1998: 3), it would have been naïve to assume that each of them are a priori a 'high potential' application, without any potential left for other (overlooked) mobile city applications.

Hence, we started with a user-driven listing of possible mobile city application(s) (ideas) by means of qualitative focus group research and side interviews with (potential) application developers. With diffusion theory and the assumptions on perceived product characteristics as a framework, 18 consumers were recruited for focus group research on mobile city applications. A first focus group consisted of 8 consumers (non i-City panel) familiar with mobile technology and applications. The second focus group consisted of 10 respondents from the i-City test panel (already familiar with the PDA's and testing the applications on the mobile city network). This selection aimed to overcome the problem of lack of familiarity with future technologies. Due to this and the lack of imaginative capacity of consumers, identifying opportunities for future technologies is often difficult. Referring to diffusionism's 'perceived innovation characteristics' this familiarity also overcomes the problem of a high-perceived

complexity or low ability to trial. By using focus groups, an ideal starting point is offered for detecting a relative advantage (e.g. added value of mobile news consumption compared to the way one is consuming news today) or compatibility (e.g. compatible applications to their current news consumption, usage of navigation technology or lifestyle patterns and interests). As 'teasers' or probes to go beyond specific types of applications, we constructed three fictional users for a hypothetical framework of 'time spending dimensions[7]' in a mobile city context. The first fictional user is Dimitri, a 27-year old manufacturer, playing volleyball, single, game-addict ... The second one was Patricia, a 40 year-old mother of two young children, working full-time, commuting between Hasselt and Brussels, and with a passion for classical music and cooking. The third fictional user, Gerard, 57 year old active senior, diabetic, often taking his wife for a long walk, and with a passion for wine, painting and museums.

Starting from the time-spending patterns of these three invented persons, the respondents were asked to think about their own context and to suggest (wild) ideas for possible mobile city applications and the relative advantages thereof, both to them and to the way they have, to date, done certain things. The resulting demand-side based list of application ideas was then presented to potential suppliers (supply-side) of such applications (e.g. the idea of mobile video surveillance was discussed with a security company (G4Securicor), school related applications were discussed with Hasselt's High School PHL) in order to check for feasibility, and the extent to which these ideas were already existing or 'in development'. In the end, the combination of these focus groups and interviews resulted in a long list of 80 possible mobile broadband city applications.

Enriched by the diffusion perspective: Clustering applications on potential for test-users mobile city platform

However, an overview of possible applications is, obviously, only a first step [8]. The sole purpose in making this was to avoid limiting our scope to a strictly supply-side driven view. A next step should help to gain some insight into the potential of these applications or mobile city applications in general.

Again, a reliable forecast of such potential is not evident due to the same limitations previously mentioned. Within the context of this project, however, this problem has been overcome, since the 600 test users were already working and experimenting with the PDA's and mobile city applications in the i-City living lab setting (cf. supra). In order to investigate the potential ideas, these 'test users' were presented an online survey in which they were questioned about their interest in the applications and the perceived relative advantage to their current way of life (5 point scales + open question in which respondents were asked to describe their current way of doing things and the situation in which the mobile application could have an added value). 312 respondents completed the questionnaire. For 64 of the 80 applications the correlations in interest and perceived relative advantage were strong enough to summarise or group them into 13 factors or 'application clusters' (Principal Component Analysis, 28 iterations, R^2 67,5% + cronbach alpha > 0.65 and item-total correlations > 0.40 for all factors). Table 9.1 shows these 13 application clusters and 16 remaining

[7] Around 8 main domains (social participation, household, study, work, transport, spare time, health, sleep) and several sub domains

[8] It may be valuable starting point for further diffusion-based research, but also for domestication based research it may be of a certain value: e.g. as an input for the phenomenal variation in the archetypal research.

single applications ranked by their average interest scores (average score on 5 pt scale 1: not interesting at all – 5: very interesting)[9].

Clearly, not all applications are equally appealing. The average interest ranking taught us that the most important are not the most innovative applications, but rather those enabling time saving and ensuring and improving life quality. Of the 13 application clusters, the most important were 'Payment & money affairs' and 'Help with serious health issues'. Of the separate applications, the 'indication of parking spaces and availability', 'public transport schedules' or 'practical and administrative information for students' seemed to be perceived as most interesting mobile city applications. However, these are merely conclusions on a more general sample level.

Since not all applications are likely to appeal equally to every single respondent of this sample, we investigated the degree to which the correlations in interest and perceived relative advantage allowed a distinction to be made between a number of internal homogeneous and external heterogeneous user clusters. Despite the skewed nature of our sample (test panel, more than average interested in technology and mobile applications), K-Means clustering allowed us to detect six user clusters.[10]

[9] The factors are marked by the label 'Factor' between brackets and an enumeration of the application numbers (cf. table supra) of the applications being member of that factor.

[10] 1 - The out of (mobile) potentials: This segment contains 19 respondents (6,6% of the sample) for which hardly any of the 80 applications has potential. This group is characterised by a dual profile. On the one hand we find a group of students with a high school degree, younger than 25 years old, not married and still living with their parents. On the other hand, this cluster consists of a group of (female) users between 45 and 54 years old, who are married and having children. We can consider both groups as laggards when it comes to the adoption of mobile city concepts. The only application they have a 'special interest' in is 'indication of parking spaces and availability'.

2 - Global interest I: Organisation & Health: As a first of two 'global interest' clusters, this segment has a special interest in applications which can be useful in an organisational and working context or in a health context. It represents 28% (81 respondents) of the sample. Compared to the other clusters, its members are between 35 and 54 years with a family life (married with children). Because both parents have a job and a rather busy lifestyle they are interested in applications that can help them organise their life by finding shops, more effective health care, making appetizers… In this type of applications they perceive a lot of potential added value.

3 - Specific interest I: Information junkies: This clusters contains only 3 members with a very interesting profile. These people have an outspoken interest in information and news related applications. Due to the small size of the cluster, no generalisable analysis was conducted for this cluster.

4 - Global interest II: Leisure: The members of the second 'global interest' cluster are most interested in applications that can be used during leisure time. The cluster has a young profile since there is an overrepresentation of (male) respondents younger than 25, students, not married and still living with their parents. This cluster contains 20,1% of the sample or 58 respondents. Some of the most interesting applications for this cluster are free mobile surfing, movie choice, keeping up hiking & cycling routes… They also perceive some added value in applications as mobile dating, note taking, find shops, tourist portals, finding people with the same interests…

5 - Specific interest II: Payments: The 35 members (12,1%) of this cluster are mainly interested in 'payment' related applications. More than the rest of the sample they are married, higher educated, between 35 and 44, and living in a busy household with children. This cluster is mostly interested in applications concerning money and payment affairs but also perceives some added value in rather practical applications like public transport schedules, smart machines on mobile…

6 - Mobile innovators: This cluster contains 93 respondents or 32,2% of the sample. This is a cluster of people to which practically all mobile application ideas are very appealing. Most of the cluster members are younger than 34 years old and have a fulltime job, but do not have a family of their own yet.

Application (cluster)	Average Interest*	User clusters					
		1	2	3	4	5	6
Very appealing							
Indication of parking spaces & availability	4.23 / 5	++	++	+++	+++	+	+++
Practical & administrative information for students	4.20 / 5	+	+++	+++	+++	+	+++
Public transport schedules	4.11 / 5	+	++	+++	+++	+	+++
Payment & money affairs (mobile payment, mobile banking, parking ticket on mobile, e-ticket, automated tolling)	4.01 / 5	-	++	-	++	+++	+++
Traffic jam alerts	4.01 /5	+	++	-	+	+	+++
Help with serious health issues (blind aid, crib death alarm)	3.99 / 5	-	++	--	+	+	+++
'Independent living support'	3.93 / 5	-	++	++	+	-	+++
Free mobile surfing	3.92 / 5	--	+	+++	++	+	+++
Find shops	3.92 / 5	-	++	-	++	-	+++
Tourist information (museum tour, tourist portal, event information, i-map, reader)	3.87 / 5	--	+	+++	++	+	+++
Moderately appealing							
Mobile search	3.78 / 5	-	+	++	+	-	+++
Doing 'usual, daily tasks' more effective by mobile (mobile domotica, smart domotica, smart machines on mobile, restaurant order & payment, e-meal, business card exchange, shared agenda, mail/agenda on mobile)	3.73 / 5	--	+	-	+	-	+++
Consultation of available places in cinema	3.72 / 5	-	+	-	+	-	+++
More effective health care (prescriptions, medication prescriptions & schedules, health monitoring, e-care)	3.68 / 5	--	++	--	-	-	+++
Doing 'unusual tasks' more effective by mobile (accident reporting, manual download, school agenda & report, monitoring organisation aid, identity & medical info on mobile)	3.68 / 5	-	+	--	-	-	+++
Download presentations or other information	3.65 / 5	-	+	--	+	-	++
Administration (heartbeat info, mobile admin., dentist appointment, CV on mobile)	3.63 / 5	--	+	--	-	-	+++
Multimedia (note taking, mobile video calling, photo service)	3.57 / 5	-	+	+	+	-	++
Movie choice	3.54 / 5	-	-	--	+	--	++
Mobile help for studies (& work) (mobile learning, study mentor, study choice guide, mobile academy, mobile terminal)	3.43 / 5	--	+	--	-	--	++
Mobile 'high tech' (video surveillance, webcam, i-nanny, finding lost elderly, mobile auction, scanning information)	3.43 / 5	--	+	--	-	--	++
Keeping up hiking & cycling routes	3.42 / 5	--	+	--	+	-	++
Not appealing							
Food & Shop Help (eQuick recipes, meal help, receipt download, making appetizers, shopper, shop alert, restaurant finder)	3.23 / 5	--	-	--	-	--	++
Mobile news & information (mobile news, mobile feed reader, mobile information services, mobile blog)	3.11 / 5	--	-	++	-	--	+
Spare time suggestions	3.10 / 5	--	-	--	-	+	+
Mobile social contacts & Friends (mobile chat, finding people with same interest, mobile flirt, mobile dating, smart mobile messenger, MapQuest find me)	2.94 / 5	--	--	--	+	--	+
Carpooling system	2.93 / 5	--	-	--	-	--	+
Location based advertising	2.78 / 5	--	-	--	-	--	+
Sport events on mobile	2.74 / 5	--	--	--	-	--	-

*Legend: 1: Not interesting at all – 5: Very Interesting

Table 9.1 Clustering applications by using Principal Component analysis

Conclusion: coming together

Although the two different approaches (diffusion versus domestication) guided the research and two different sets of methods were used, the findings relating to mobile city applications were very similar.

In the domestication approach, we found that utilitarian activities were frequently carried out while 'on the move', and that people wanted to finish them as quickly as possible. This corroborates the finding of the diffusion approach that time saving applications are very much in demand. Such parallels illustrate the potential complementarities between the two different approaches.

By using archetypal user research, we were able to gain an understanding of the conceptual phase of the development of wireless city applications, allowing us to give essential input for the following phases of testing, experimenting and evaluating applications within the development process, based on user experiences and requirements. Yet diffusion theory, too, can be a valuable framework for some of these phases, such as the evaluation of applications in terms of forecasting adoption potential or the size of its potential innovator, early adopter, majority and laggard segments.

We found that archetypal user research affords the opportunity to 'tune in' to a practice-oriented categorisation to start the ethnographic research from within a domestication perspective. In the same sense that the Jungian archetypes are innate and primitive prototypes for ideas, our archetypes start off as primal categories of people. For the diffusion approach, the other research team made stereotypical, archetypical descriptions of potential users, to trigger their panel members to think of future applications .

Combining both traditions in one project enabled a more complete picture of the usage patterns of mobile city applications to be put together. In the light of the complementarities, sequential application would probably yield the best results. That way the diffusion approach could explore the most promising application ideas. The latter could then serve as the basis for the phenomenal variation in selecting between the adequate archetypal users. Abstracting the affordances of these applications could then serve to gather in-depth information on the why and how of mobile practices-to-be that are plausible, taking these affordances into account.

In conclusion, we may refer once again to Bockzkowski (2004). With the help of the research conducted within the context of the ROMAS case, we hope to have contributed in the search and illustration of how social shaping/domestication and diffusion can indeed be two intimately tied sides of the same innovation coin.

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CHAPTER 10

Social innovation among ICT users: Technology as catalyst in promoting social change

Serge Proulx

Introduction

User-centred innovation research by scholars such as Eric von Hippel (USA) 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 chapter 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 organisation, 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 driven, that is, with political and economic contradictions. These activists position their technological practices as an opportunity to renew social forms of organisation, of collaboration and of communication. In criticizing the prescriptive and normative composition of technical devices marketed by large-scale software and by telecommunication 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 grassroots 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'.

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.'[1]

To establish that a genuine appropriation of technology is taking place, one prerequisite - access to the technical device - and five conditions must be satisfied:

(1) Technical and cognitive mastery of the artefact.

(2) 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.

(3) Innovation: using the device introduces new creative avenues into the individual's social practices, rather than merely participating in them.

(4) Community mediation: learning processes and support are shared within a mobilised collective or community of practice with which the user identifies.

(5) 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.

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[1] Wikipedia.

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 digitised 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 capitalise 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 and 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 (Granjon, 2001; Castells, 2002). We seek to identify the extent to which code activists are part of a process of civic negotiation of our societies' digitisation (Boltanskia and 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 of the time, technological objects issued from information and communication technologies (ICT) are perceived by users as 'black boxes', ordinary users 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 organisation 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 (Neff and Stark, 2003; Oudshoorn and Pinch, 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 and Law, 1992), and socially appropriate (Proulx, 1994, 2002) the technology. New principles for collective action emerge from these hybridisations of social and technical spaces. Only those uses of technology that lead to tangible change in social practice can be characterised, according to Tuomi (2002), as innovation.

A research project studying techno-activist practice as a source of innovation

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 organisation, 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 organisation 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 organisation 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 realisation 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 transparant [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 and Delsalle, 2005; Aiguiton and 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 democratisation 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.

(4) To trace the prospects for generalizing these practices and innovations to contribute to the common good.

Methodology: Participative ethnography

Putting a participative approach in place (Dallaire, 2002; Barnsley and 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 organisation. 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 teaches the group about itself and thus stimulates self-analysis within groups regarding clarification of their missions and organisational 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?

Hints and results: Towards a politicisation 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 reconceptualise 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 organised 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 (Bencheikh, 1986; Jouët, 1987). 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 politicised 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 hypothesise 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 organised (Proulx and Couture, 2006).

Innovations in informational cooperation

In experimenting with new forms of collaboration around the organisation 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 stabilised. As in some scientific communities, multiple controversies over how technology uses are articulated into work organisation 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 decentralisation of technological action, procedural governance, and collective management of training (Proulx et al., 2007, 2008).

Conclusion: what sort of digital world are we constructing?

Grassroots 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 globalisation (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 et al., 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 'organised civil society' as part of what economist Eli Noam has called a 'third wave' of Internet leaders (Noam, 2005), more politicised 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).

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CHAPTER 11

From 'simple customer' to 'warm user' Or, who cares about connections in community innovations?

Stefan Verhaegh

Prelude

Scene 1: Leiden (the Netherlands), April 2007, 08.00 PM

An ordinary Thursday evening in a small town in the Netherlands. While it is raining outside, I accompany John[1] – a male single somewhere in his early forties - on his way towards the 'Hooglandse Kerk', one of the old buildings that grant the historical city-centre of Leiden its picturesque quality. After borrowing the church key from the nearby-housed parish clerk, John unlocks one of the side entrances. Inside, he walks straight up the narrow and creaky stairwell to the top of the bell tower. Once arrived on the bell platform he switches on his torchlight enabling him to locate the aim of the trip: three brightly-yellow painted military ammunition boxes connected by heavy duty cabling to artfully camouflaged aerials. From a distance they are only barely discernable from the sandstone tower walls. Carefully he opens the three yellow boxes to reveal their inner secrets. From his coat pocket John grabs an electronic scheme showing the functions of the various cables and buttons. The cover reads 'Debugging checklist node Cetim'. John explains: *I got this manual from Ed. He knows a lot about computer networks, and wrote down this debugging manual so people like me who are not really experts, can still do checks on their own.* After reading the description, John presses some buttons, watches some lights switching on and off again and compares their status with his scheme. After a few minutes the devices seem to have been properly restarted. *Look the LEDS are blinking again; that means the node is connected again.* A smiling John: *Mission accomplished; time to go home.* We descend the stairway again, switch off the church lights, carefully lock the church door behind us and return the key to the parish clerk.

Scene 2: Leiden, February 2006, 11.00 AM

On a sunny Saturday morning I attend a Wireless Leiden information meeting on the second floor of one the Leiden public libraries. A woman somewhere in her thirties introduces herself as Linda and explains that she will give a presentation on 'Wireless Leiden from a user's perspective'. Whereas the two previous speakers had made extensive use of a laptop and a beamer to illustrate their presentations with photographs, 'screenshots' and diagrams, Linda abstains from such techniques. She starts with an explicit warning: *During the talk anyone is free to ask questions, but if it is about computers or Wi-Fi I will probably not be able to answer them. I am no technical expert or official volunteer like the previous speakers. Dirk, one the Wireless Leiden people, just asked me to help him by telling something about my experiences as*

[1] John is not his real name. For privacy reasons I changed all users' names in this chapter.

a typical home-user of the network, so that is what I will do during this talk. She continues about the work that was involved to get connected to Wireless Leiden: *There is a document about how to get connected, but it is all very technical with things like 'ping-ing', 'NAT-ting' and 'releasing your IP-address'. So you probably need someone knowledgeable to help you configure it all.* Linda ends her talk by summing up the things that work, such as browsing websites, checking her Hotmail account, versus the things that did not work: filling out tax forms online, ordering digital prints of holiday pictures, downloading movies with peer-to-peer software or checking her work e-mail. Afterwards she helps interested members from the audience by hooking them up with a Wireless Leiden volunteer.

Introduction: understanding domestication of community innovation

The central theme of this chapter is the work done by users in order to get an innovation 'working' in their everyday life. In this case the empirical data concerns a 'community innovation' (Van Oost et al., forthcoming) creatively 'innofusing' (Fleck, 1994) Wi-Fi, in which the innovation and the community are intimately interwoven and cannot be separated from each other. Although there is a rich literature on the domestication of consumer goods such as the television, radio or personal computer into daily use practices (Silverstone and Hirsch, 1992; Lie and Sorensen, 1996; Silverstone and Mansell, 1996), similar literature in the realm of community innovation is lacking. The central argument of this paper is that when the innovation itself is configured as a 'fluid technology' (De Laet and Mol, 2000), its users might be configured (Woolgar, 1991) differently as well. In order to study the domestication of community innovation I built my analysis on two strands of literature within Science and Technology Studies.

First, the 'material semiotics' of actor-network theory offers valuable insights on how to include technology itself in the analysis as active mediator of domestication processes. *Science in action* (Latour, 1987) offers a summary of this theoretical approach. Relevant for this chapter is the way this approach conceptualizes innovations as heterogeneous networks consisting of both human as well as non-human elements. According to Latour, the innovation exists at the point of intersection where the planes of the 'technogram' and the 'sociogram' keep each other balanced. Building on this analysis in this chapter I conceptualize the stabilization of 'community innovation' as creating actor-networks that can withstand resistance successfully by keeping all the elements connected together through stable links.

Second, the research strand on 'invisible work' foregrounds actors originally deemed unimportant, such as secretaries, housewives, nurses, call centre 'reps' or technicians, by further investigating their essential roles in keeping complex systems working (see Shapin, 1989; Star, 1991; Oudshoorn, forthcoming).

Whereas in 'commercial innovation' this work of keeping innovations functioning properly is delegated to paid maintenance workers and helpdesk employees, in the case of community innovation such paid forces are simply lacking. The question then becomes 'who is doing the work to keep everything connected to prevent a stable innovation from decaying into entropy?' Inspired by this strand of literature this chapter focuses on the work done by people without technical expertise, hobbyist or volunteer motives, or economic interests in relation to an innovation. Which then leads us to ask 'how simple is a simple customer?' actually when all kinds of work are involved to get connected and stay connected in order to use an innovation.

According to Latour, the 'customer is 'simple' because he or she does not have to redesign' the technological artefact. However the fact that the user has had no role in the original design of an artefact does not mean that there is no active involvement (Latour, 1987: 137):

> '[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.'

This active customer is the actor we follow in this chapter to understand what makes community innovations differ from 'commercial' innovations that distribute black boxed consumables via the free market to 'simple customers'. The commercial 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/manufacturer who transforms the idea into physical mass-produced artefact and at the user/consumer who buys the product (Rogers, 1995). 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' technological artefacts such as car engines or photo cameras.

When we are dealing with community innovations this becomes more complex. What happens when a community innovations stops working because elements get disconnected? The specific focus for this paper is on who is doing the (invisible) work to keep connections between human and non-human elements within community innovation stable. Especially as the resources of traditional corporate organisations are lacking such as call centres, service and repair personnel and budgets. 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 more unreliable. Let us have a look from the perspective of the user at a specific case of community innovation to see how connections between the different elements are kept stable.

The Case of Wireless Leiden: connecting community and innovation

To be able to unravel the puzzling prelude scenes, first we need to know something about outdoor Wi-Fi community networks in general and Wireless Leiden in particular. Let us start with the unforeseen uses of the IEEE802.11 standard, also known as Wi-Fi. Almost immediately after the availability of cheap wireless networking equipment from 1999 onwards, users started outdoor experiments with it and reported their results on the Internet. The script (Akrich, 1992) of Wi-Fi devices only enabled use in indoor short-range environments while constraining use in long-range outdoor use. This resulted from developers optimizing the Wi-Fi standard for use in office buildings and shopping malls, manufacturers creating non-weatherproof devices, and legislators

demanding tinker-proof designs to prevent electromagnetical interference. Nonetheless, users enabled outdoor long-distance wireless connections by modifying software settings for long distances, weatherproofing devices, and attaching better antennas. All over the world small groups of Wi-Fi enthusiasts started building wireless networks. Although many initiatives remained relatively small-size hobby projects, some evolved into non-profit broadband Internet providers, usually in rural areas where commercial alternatives are lacking or prohibitively expensive.

Against this background let us zoom in on a similar Wi-Fi network with the name Wireless Leiden, situated in Leiden, a city with approximately 120.000 inhabitants in the western part of the Netherlands. In this case volunteer hobbyists assembled a wireless outdoor infrastructure out of consumer-grade Wi-Fi equipment, open source software, homebrew aerials. The innovative element of this network is that its back-bone infrastructure is completely wireless, consisting of nodes routing data packages wirelessly through the air from one to another. The size and complexity of this network is globally unique, as well as the degree of involvement from local government, corporate sponsorship and municipal support. There is much more to be told about all the ingenious technical and organisational solutions invented to make Wireless Leiden work, but I will not tell this story here, because the WL builders already did so clearly and concisely themselves (Van Drunen et al, 2003).

That such a 'hybrid community' (Callon, 2004) can be managed into existence since 2001 as a 'professional, volunteer-run organization' whereas many similar efforts disappeared in the first year of their emergence, makes it interesting enough to find out how this stability between all heterogeneous elements is actually accomplished. What sets Wireless Leiden apart from other Wi-Fi community initiatives is the diversity amongst its involved actors: a 'technical hobby community' (Haring, 2007), the local municipality, corporate sponsors, electronic parts stores, churches, schools and libraries, and thousands of Leiden inhabitants using it for Internet access in their everyday life.

Although all actors connected to Wireless Leiden, their view on what this network actually is or should be, varies considerably. For the initiators who built the wireless network based on a shared ideology of 'free access' (as in 'free speech'), the most important characteristic is that Wireless Leiden cannot be censored by governments or controlled by corporations. For most residential users however, this is not an issue at all. Most of them only became interested in connecting with the network after the introduction of free access to the Internet (as in 'free beer'). For them Wireless Leiden equates zero-price Internet access, even given the restriction that it can only offer a gateway to the World Wide Web and not to everything else on the Internet that is not *behind port 80 or based on the http protocol*. What all actors connects however, is their shared understanding that all of them take part in a larger non-corporate, local grassroots community initiative that can only exist through active participation by those who care about it. As such all actors understand that *with great freedom, comes great responsibility*. Or sometimes, it comes with great hassles as well.

Connecting a Wireless Leiden user: the story of Linda

Although the development of Wireless Leiden is a great effort in itself, it takes great effort to connect to it as well. As a window for the reader to peek into a WL user's private home as the setting for invisible connection work, I offer a condensed version of an interview with Linda. She lives in a small village near Leiden, works as lawyer and

has twho children of primary school age. In her story Linda gives a detailed account on how she succeeded to get herself and her family attached to Wireless Leiden.[2]

Until recently, 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 she discovered it was lacking a built-in ISDN connection. In order to restore Internet access she had several options.

To frame it differently, her new PC put Linda at a 'consumption junction' (Cowan, 1987): buying a new modem to continue with ISDN, or subscribe to a cable or ADSL Internet service. What bothered her about the ISDN scenario was the 'pay per minute' subscription model. At the moment her children were increasingly using websites such as Wikipedia to complete school assignments, ISDN could turn out to become an expensive affair. The monthly fixed fee scenario seemed more favourable to her.

However, serendipitously, a third scenario for Internet access presented itself. During a weekend visit her father opened his Wi-Fi enabled notebook, while sitting outside in the garden, and noticed a Windows message telling him he was connected to 'AP-OMNI-HOFWIJCK'; a Wireless Leiden node. After some fiddling with the proper configuration of something called a 'proxy', the notebook computer was able to surf the web. And the best thing: it all worked for free. Neither registration nor subscription was required.

A few days later, browsing the web at work, Linda found a local Leiden hardware store selling all the necessary equipment to connect her own PC to Wireless Leiden. In the weekend Linda and her husband visited the electronic shop and in exchange for 150 Euros they received a complete 'package' consisting of an outdoor Wi-Fi antenna, 'bridge' and indoor Wi-Fi access point. With this setup, no additional cabling was needed to link the rooftop antenna to the living room PC. From Linda's perspective Wireless Leiden offered Internet access without time restrictions or monthly fees. Additionally she sympathised with making use of a local non-profit Leiden initiative rooted in the idea of 'free access for all', instead of a commercial service.

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.

However after a while new problems arose with the WL connection, and Linda could no longer fall back on the shop owner for support after his initial free installation. After browsing the WL website at work again to find a solution, she sent an e-mail to the WL

[2] All quotes from interviews, meetings and e-mails were translated from Dutch into English.

user mailing list under the heading 'Nitwits wants Wi-Fi in the vicinity of Leiden'. Initially people responded by sending her a 'debugging check list' a step-by-step document to guide novice WL users establishing a working connection, or to pinpoint the precise problem. However for Linda this strategy failed due to her lack of understanding of the technical jargon. As a final resort she asked one of the volunteers to come over to her house to help her solve the connection problem.

Although WL is a volunteer organisation, there is no such thing as a free lunch. As a favour Linda was asked to give a presentation at a Wireless Leiden promotion meeting, which she returned as described in the prelude. So here we see a pattern of new users who are actively helped getting connected by neighbouring WL volunteers. In return for this support however, active participation from the user in the form of helping others is expected. Domestication thus is a process that flows in two directions based on reciprocity. First Wireless Leiden populates Linda's home, not only in the form of new devices, antenna's and data packages, but also in the form of embodied knowledge when WL volunteers come to fix Internet access in her home. Second, however Linda comes to populate Wireless Leiden, when at information meetings she transmits her expertise on being a non-technical user is transmitted to the audience. Not only the Wi-Fi devices in Linda's home are configured, but Linda herself is configured as well as an active user, who then again configures Wireless Leiden to better connect to lay end-users. All based on contributes back to community in a reciprocal manner.

Connecting a Wireless Leiden node: the story of John

The story of John offers another example of this reciprocal domestication of users into the daily functioning of technology in addition to technology becoming part of user's everyday life. In this story we learn how John becomes a 'node adoption volunteer'. Currently, these node adopting users take care for most of the daily maintenance of WL. Without actors performing maintenance work eventually every technology breaks down. This process goes even faster in community technologies, where reliable expensive technology is replaced by recycled more failure-prone computer parts. Building nodes from scratch is one thing, but actively maintaining them is clearly another thing and usually something the original creators have not much interested in. This is also true for WL. Most of the technical experts are only interested in experimenting with a new technology and not in reconnecting a wireless node for the hundredth time. When the WL technical enthusiasts speak about their motivation for their participation they often use 'frontier' metaphor of 'pioneering' or 'cowboying'; however 'caring' for users or maintenance is lacking their vocabulary.

This lack of motivation for keeping connections between WL nodes and the rest of the network stable is something many WL participants have identified as a potential problem for the further growth and development of WL. As a solution for the lack of resources for this 'connection' 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.

This new user role emerged from a discussion on the WL mailing list that started in February 2004 when WL user John decided to add a more positive note to one of his regular e-mail complaints about the breakdown of one of the Internet gateways:

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 play an active role in the community innovation by contributing something back to WL, but I do not know how lacking the technical expertise and skills of the 'official' WL members. With this post John sets off a cascade of e-mails in which the 'usefulness' of user-contributions is discussed. After several invitations to join the weekly 'technical meetings' or to subscribe to the 'systems administration mailing list' one of the 'technical experts' further sparks the discussion by ironically stating that *unfortunately it is not attainable that every user can contribute something to the network, except for additional data traffic ;-)*.

Another WL volunteers responds:

I do not agree with you on this, because I do think anybody can contribute something. You do not need any understanding of computers. For example organizing information meetings or updating the website are important activities. One of the most time consuming jobs is powering nodes on/off. This needs not to be done very often (usually 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, they could do a yearly inspection just to check if everything is still well connected. The advantage is that users live close-by and immediately notice problems in case of a malfunctioning. This is cot difficult to do, it requires no special expertise and 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 summarises 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 relatives this remark by noting that *we should also realise 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.* Since causing the stir about nodes needing help in the beginning of 2004, John gave several presentations

about his experiences and is still taking care of keeping 'his' node Cetim properly connected. In this way Wireless Leiden has domesticated John into their network in a similar fashion as John has domesticated the Wireless Leiden network in his home.

Analysis: Warm connections

Informal support helping people 'hooked up' to network technologies is not something exclusively restricted to community innovations. In her research on the domestication of the Internet, Bakardjieva (2005) noticed a similar phenomenon.[3] 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'. Out of her empirical data Bakardjieva developed the concept of the 'warm expert' 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'. (Bakardjieva, 2005: 101) In WL we see the same mechanism at work, although the gifting is related to the WL community. In the previous stories of WL users we have see a 'gift economy' in action, in which reciprocity towards the community ('tit-for-tat') is keeping-it-all-working. When an expert helps a user to get connected, the user then is asked to help the expert, for example by translating 'debugging check lists', by giving a presentation in non-technical language or by taking over relatively easy maintenance tasks. In this way users are actively involved with stabilizing connections by maintaining technology and supporting the 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 (2005: 13) 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

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[3] James Stewart observed a similar phenomenon, in which he conceptualized the main actors as 'local experts' (Stewart, 2007). As a result of his social network approach, Stewart's main focus is on human-human interactions. This makes the concept of local expert less suitable for exploring 'warm' relationships between humans and non-humans.

> 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.'

In community innovation however, users are not dispersed due to the availability of 'forums'and communication 'channels' in the form of local meetings, mailing lists and interactive wiki's. These channels not only enable communication with other users, but enable interaction with the designers of the system as well. 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 of support' enables both the correct configuring of users as well as devices enabling stable interaction with each other.

Within a community innovation the gift economy is one of the principles on which maintenance and support work is organised. Examples of reciprocal gifting by users in return for help consists of writing documentation, answering other users' e-mails, giving presentations. The economy that enables Wireless Leiden to function is not a financial one, but one based on gifting based on 'warm' relations. Where in the commercial innovation users pay money to a company to compensate for the salary of repairmen, in the case of community innovation, users '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 the situation of a commercial Internet access subscription technologies are expected to be stable black boxes, with companies expected to fix problems. However, in relation to community innovations, users are more forgiving and prepared to participate in 'helping" fluid technology in case of a failure.

In this sense not only 'warm experts' who with their intimate knowledge of technology can help users; in addition 'warm users' with their intimate knowledge of how they experience new technologies work can help both experts and devices supporting the community innovation. The unit of analysis is not the individual user, but the community innovation as a whole, including all its constituting humans as well as non-humans. If linkages between elements and the network get disconnected, 'warm users' can help to repair them.

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 organised through wiki's, mailing lists, homebrew 'debugging lists' as well as socially through local meetings and personal visits. In addition when Bakardjieva (2005: 102) 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 WL users have learned not only what WL can do for them, but additionally what they can do for WL. Where support of users is organised by 'warm experts' helping people to get connected, the equivalent is maintenance of the technology organised by warm

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 emotional proximity and personal physical contact not only applies to humans but also to non-humans in the case of community innovation.

Conclusion: from 'simple customer' to 'warm user'

Earlier students of science and technology have pointed us to the importance of 'invisible' actors such as technicians in the practice of 'doing science' and the stabilisation of facts. Following this line of thought, I argue that we cannot understand the practice of 'doing innovation' and the stabilisation of fluid technologies without explicit attention to the roles of 'lay end-users" lacking explicit technical. With this chapter I want to give voice to this invisible work by 'warm users'. By doing so, I aim to enrich the image of a users as 'simple customers' into 'active participants'.
The phenomenon of 'warm user's 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. An example is FON (www.fon.com), a company trying to mobilise 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 for participation is organised along the lines of becoming a 'Fonero', a member of the 'FON movement'. However Fon will not be based on gifting alone. In addition the company is introducing a financial compensation model for 'Foneros' as well.

An interesting question is in how far users will be motivated by and are able to identify with commercially organised distributed network innovations in which they are allowed or even supposed to play an active role. This will depend on finding strategies to mobilise 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 domestication dynamics of distributed ICT innovations in which users play a crucial role.

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CHAPTER 12

Conceptualising online news use

Ike Picone

Introduction

When the World Wide Web was introduced, doom scenarios predicting the end of newspapers and television appeared. And yet, 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 and Tewksbury, 2000), the Internet is still seen as one of the major reasons for the decrease in newspaper readership. 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 websites which 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. The motivations 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. Contrary to what new media and social software proponents and the hype on web 2.0[1], would like us to believe, the participatory customised in-depth news is far from being commonly used and expected, even if the technological means are available (Project for Excellence in Journalism, 2007). The social structure of (online) publishing is not changing as fast as the constantly improving technological capacities of the online medium (Kling and Callahan, 2003).

This social structure is the starting point of this chapter that intends to investigate the changing relationship between users and (news) content producers. The authors in this book offer different theoretical frameworks to study this relationship ranging from more user oriented approaches (e.g. quality of experience, domestication, diffusion) to more structural and infrastructural approaches. This multidisciplinary method is needed when striving for an overall understanding of users' role as innovators. All these studies refine and complete the existing concepts in media and user studies and contribute to an up-to-date conceptual framework for the study of changing media use.

[1] People at the origin of the World Wide Web (like Tim Berners-Lee) do not think that the term Web 2.0 is an adequate description, as the technology to make these new services possible was already available in the early days of the Internet.

News in the digital age

The digitisation of news and the explosion of user-friendly applications that have arisen from the so-called Web 2.0 offer users a wide array of tools not only to consume news, but to almost instantly and effortlessly share, comment, search, organise, publish or deliver it. Applications such as search engines, RSS, tagging, rating, bookmarking, blogging, etc. distort the linear way of presenting news from source to reader. In this Fordist process, added value is created by each of the discrete steps of the production process from raw material to finished product: the newspaper. For a long time, the 'reading' of this product was seen as the end point of this process. These walls are now showing breaches as the audience is finding more and more ways to respond to this product not only at the end, but also at earlier phases of the production process (Geens, et al., 2007). Readers are then participating in the creation of news - adding value to it - rather than just consuming it, what led Gillmor (2004) to observe that news is becoming a conversation instead of a lecture.

This chapter will analyse those changes in the relationship between newsreaders and news producers. Relationship, which occurs as a result of the use of participatory features of new media. The roles that are traditionally ascribed to newspapers in mass media theory will be the theoretical point of departure for this analysis. Although mass media are traditionally seen as agenda-setters, watchdogs and/or content providers, a more participating news audience now challenges these roles. 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. The scope however is not to give an in-dept overview of the theory on these roles as this has already been thoroughly done (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 lies on the participatory possibilities of these features and not on aspects like time-shifting, the ubiquity of news, decreasing willingness – to – pay, etc. that play an equally important role in the way users relate to content producers.

In order to investigate this relationship, we look at recent research on user participation in news and beyond and hold it against more traditional theories on mass media roles. 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 and 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. For this chapter, 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 chapter's uniformity. Because the experts' responses are relevant as information source rather than as respondent answer, this does no compromise the methodological process. The scope of the interviews was to gain explanatory and process knowledge on the Flemish situation in Belgium as well as an insight in what people actively involved in the sector experience as the most important bottlenecks towards the newsreader.

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. As McManus (1994) pointed out, market-driven journalism has jeopardised media's role as an independent fourth estate since the eighties. People's ever more rushed lives and the growth of new and often complementary media have reduced time people are able to spend to reading newspapers and the attention they can pay to articles. This was already the case when radio and television appeared, but the introduction of the Internet stepped it further because of the digitalisation of content. The Internet being a medium for text, audio and video, newspapers, television and radio stations 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 services like nu.nl, Google News, msn.com and the blogosphere. As an expert puts it, editor-in-chief of a Flemish newspaper: *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 of how newspapers will remain viable in this context, as rightly said by the Economist: Who killed the newspaper? (The Economist, 2006b)

The role of newspapers in a democratic society

From its early days, the newspaper was an actual or potential adversary of established (democratic) powers, especially in its own self-perception. In this regard, the term 'fourth estate' is used in literature, later on joined by 'public watchdog', a concept covering the notions of the press representing the public, being critical of government and advocating for changes. 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, and to reach an 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 which news is to be covered and which issues are emphasised. As Weaver (2007) 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 how media may suggest which issues to use in evaluating political actors.

Finally, the press is an important news provider, a window on the world for its readers. McQuail (2000) puts it as follows: 'A responsible press should provide a full, truthful, comprehensive and intelligent account of the day's events in a context which gives them meaning.' As the interviewed experts unanimously stated, apart form bringing the news, newspapers must, offer the readers the background information and other informational means to fully understand and contextualise what happens. Still, both on national and international levels, news is a commodity, according to the innovation manager of a large Flemish media group. As the editor-in-chief 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 Dennis 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 subsequent gate-keeping process is one of the roles 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 chances that online readers will be exposed to the particular stories that a newspaper's editorial staff deems important (Althaus and 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 differently from online readers.. 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. However, not only do the features of Internet make it possible for readers to be more selective in their readings, but also 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 – albeit often unconsciously – 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, but 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, working as a manager for a telecommunication company's news portal, 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 responsible for the online edition of a Flemish women's magazine 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 the editor-in-chief 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.*

The innovation manager emphasised the importance of good filters in the increased news offer, believing that: *This role could be taken up 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 a number of cases, it has been proved that user communities are able to use the Internet 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 built round a newspapers' site, an the innovation manager referred to the term gatewatching, coined by Bruns (2005). He referred to it as follows: *Letting the participative happen and just watch whether the delivered content is acceptable in terms of privacy and deontology.*

An interesting concept in the agenda setting theory is the inter-media agenda-setting model, the process in which media coverage of a certain topic increases after major media players give it a prominent role (Song, 2007). This is a relevant concept because it plays an important role within the alternative news source community. We

could speak of the inter-blog effect. As another expert, an important Flemish political blogger and internet entrepreneur, 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 so that their impact increases. 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 working for a Flemish association promoting in-dept journalism 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, as early as 1994, John McManus pointed out is his book *Market-Driven Journalism* that the press has evolved in its 150 years of existence, making news a *commodity* in the news *market*. 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 Eizenstat (2004) 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 people publish information. Moreover, it also makes it easier to communicate over large distances at high speed. What the Internet, websites and email did for civil society, web 2.0 is doing it for 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 e.g. the Rathergate scandal (Van Brackel, 2004). In this regard, Joe Kraus (The Economist, 2006a), the founder of JotSpot, which makes software for wikis, states: '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.' 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 levels of expertise. Such people have a certain authority that can compete with that of a news agency. The expert working for the in-depth journalism association 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 support of the public.

Newspapers as information/news providers

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. The general editor-in-chief of a large Flemish newspaper company said: *What I am doing 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 the political blogger 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. 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 to be increasingly 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. Hyper-local news is a third kind of information user might be more suited for to bring than newspapers. A hyperlocal news site 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).

Several of the interviewed experts stressed the fact that journalism is becoming a conversation rather then a monologue. *An article is not the finishing point of a journalist's work. It is only the beginning*, as the women's magazine editor 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 in the first part of the chapter, the increasing possibilities users have to contribute and participate in the production of news is altering the relationship between newspapers and their readers, who are taking over certain parts of these roles. The dimensions of participatory media use as shown in Figure 12.1 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 Table 12.1.

Role / *Action*	*Agenda Setting*	*Watchdog*	*Content production*
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

Table 12.1: Consumer – Media interaction

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 on 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. This convergence of technology, at this point represented best by the connected computer, leads to a convergence in media use 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).

The prosumer

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). 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. In reaction to this Bruns (2007) suggests the term *produser*, turning away from an economic value scope and putting the phenomenon into a broader perspective: 'Wikipedia content development itself is therefore neither production nor service provision, then, but a hybrid process, which – as it is carried out by users who are also producers – can be described as *produsage*.'

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 or *produses* it. 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: the use of the news in a variety of ways consuming and producing it at the same time.

Dimensions of participation

Traditionally, watching television is termed as a lean-back activity, whereas sitting in front of a computer is rather lean-forward. (Körber and Maknavicius, 2003; Jansz, 2005; Williams et al., 2005). 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.

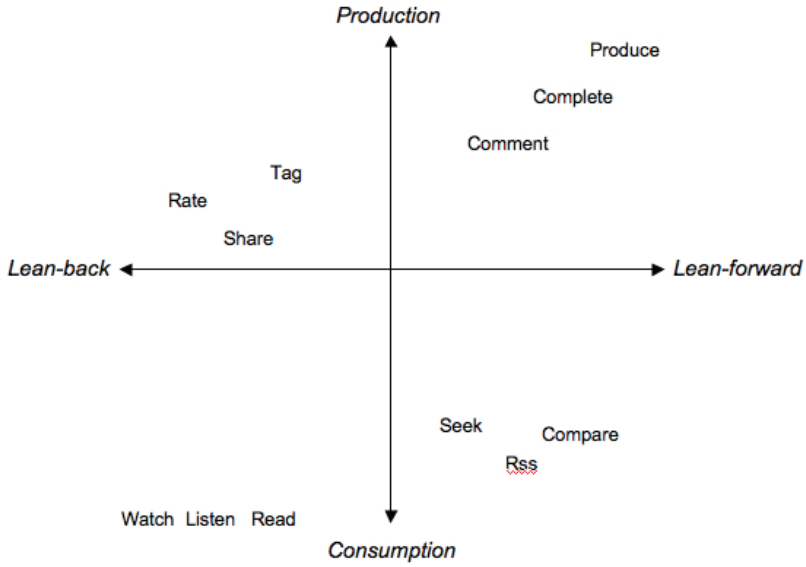

Figure 12.1: Dimensions of participatory media

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 looking 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 *produsage continuum*. In the online world, consuming is not by definition lean-back, and also *produsing* can be done in different degrees from less to more lean forward, as is shown in Figure 12.1.

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 the innovation manager 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. 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 synthesisers; the body is made of 100 consumers. He states that for each person 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. By using the above continuum to analyse news practices, we do not need to see

participation as something people do or not, but can do in different degrees, allowing us to get a far more specialised view on how people look at these possibilities.

Contributing to 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 or *produsage* 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 precipitate.

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CHAPTER 13

The evolution of services with ICTs: Remote assistance device for elderly people

Anne-France de Saint Laurent-Kogan

Introduction

This study deals with the general problem of the social insertion of services with ICT. It examines the case of the remote assistance device, developed to enable elderly and dependant people to continue to live 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 (Saint Laurent-Kogan, 2004).

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 were to wear a medallion or a bracelet, which, when activated (1), allowed 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) (see Figure 13.1). 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).

The sociology of sciences and techniques has taught us to consider all technological innovation as a complex interrelationship between techniques and humans (Flichy, 1995). From the outset of remote assistance design, the end-user was represented within the scope of the technical object, i.e. to keep elderly and dependant people longer 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-socialisation. 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 or her spouse and who has fallen, breaking the neck of his or her femur without being able to get up to call for outside help. By activating his or her medallion, this elderly person can call for life-saving help!

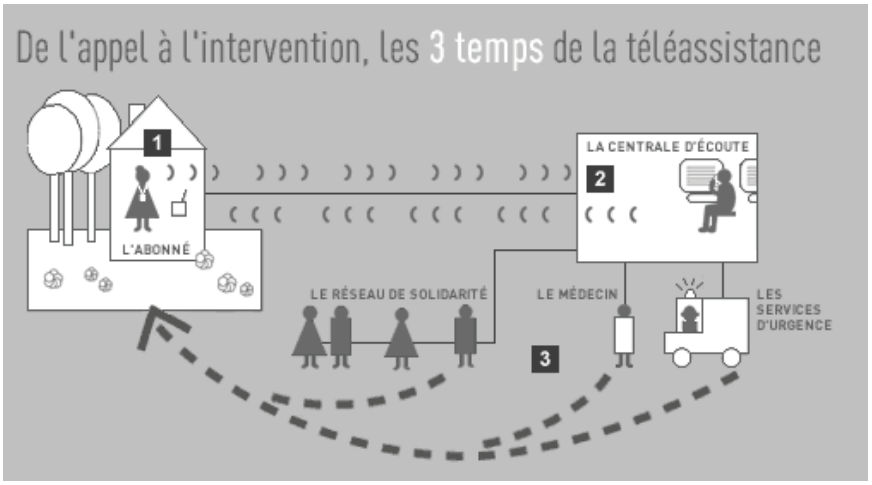

Figure 13.1: From the call to arrival of help, the 3 steps in remote assistance[1]*: 1) a subscriber - 2) a listening station - 3) doctor, emergency services, or network of volunteers*

In the case of a remote assistance device, the implementation of a remote service and its analysis stir up an organisational problem (Saint Laurent et al., 2002).
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, it is necessary to 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, the French *départements* will implement a series of measures to create a policy aimed at keeping the elderly longer at home, of which remote assistance is one aspect. In this scenario, the 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).

Unlike the majority of other European countries, France did not opt for a single emergency phone number. The fire brigades provide most of the initial emergency services for the public at large. The job of the SAMU 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

[1] Thanks to Presence Verte for the Figure, <http://www.presenceverte.fr>.

being very well defined... In reality, these emergency specialists must often work together.

When confronted with the difficulty of evaluating - quantitatively and qualitatively - the emergency needs of the dependant elderly, various elected officials have historically made choices that have mainly 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. He thus 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 centre for the elderly. There were some who categorised them as 'pee pee-pooh 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.

Indeed, the first service provided by the centre was the SAMU, which involved sending help to people who needed to be hospitalised, to ensure they received emergency care and to guarantee their transfer to hospital services in the best conditions possible. A single phone number was created and the service was immediately very successful. However, this service was very rapidly confronted with the problem that numerous calls came in, which did not fall within the purview of the SAMU. People were calling with questions about the flu or minor health problems instead of with serious injuries. To respond to the other minor medical problems, the AMU was created: a network of doctors in towns (GP's and emergency specialists), who could be called to care for people who had been in accidents or were ill, but who did not require hospitalisation.

As the SAMU and the AMU were solely concerned with the medical field, a solution remained to be found for the endless number of cases ranging 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, which he called Biotel.

The documents accompanying the presentation of Biotel indicate a service which is still concerned with safety and assistance. Nevertheless, the documents are divided into three different types of calls, made by the elderly to Biotel: emergency situations, medical problems and calls for minor problems. This latter category also comprises 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 on a particular problem? The operator will respond in all these cases".*

Offering as a complementary service the possibility of « a simple conversation » with the listening station, Biotel is a shadow organisation of the SAMU offering, via remote assistance, a service which takes calls which do not concern medical emergencies.

As soon as the remote assistance service was set up, the volume of 'convivial' calls was so high that the SAMU made an attempt to categorise these calls, breaking them down 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 to 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 from elderly people seeking contact and comfort (the need to speak to someone / needs of everyday life), whether or not emergency assistance was required, were extremely numerous.

From 1987 to 2001, the SAMU received 376 158 calls, of which 90% did not necessitate emergency assistance. Of these 90%, 74% were convivial calls or « wrong numbers ». In 60% of the calls requiring emergency assistance, the caller was visited by his or her sponsor. The majority of calls necessitating emergency assistance were made in connection with a fall, the second most common reason for calling was the need to speak to someone.

The need for social contact 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: some 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)

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

For this reason, the SAMU today 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 linking hospitals and clinics with the fire brigade's new alarm system..

We were in an emerging market, the political decision-makers supported us and the fire brigade were setting up a management centre for fire alarms with the ability to receive calls from the entire department, but what wasn't known 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 oversee; 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, with the fire brigade at the centre 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 centres and on the other hand, the application of laws concerning social assistance policies for the elderly.

As Rochette and Marchandet (1998) previously pointed out with regard to 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 doing so, 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 be determined to a large extent by the know-how held by the various professions - to the detriment of the initial demands (Rochette and 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'. From a technical point of view, the hybrid approach posed no major difficulties. From a social point of view, however, this approach was more problematic: at the start, when faced with the difficulty of evaluating both quantitative and qualitative needs, health-related emergencies only were associated with the use of remote assistance. However, as the years went by, the emphasis increasingly shifted towards the alleviation of social problems, placing the fire brigade in a very ambiguous situation, in a role with which they did not agree, and one which forced them to intervene in situations that did not concern them. Over a fifteen year period, the (Perriault, 1989) remote assistance project 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 reporting to the local authorities on the service rendered, as the fire brigade must then refer to the classification of calls used by 18. The figures supplied by the station are then published in an annual report. Examining 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 13.1).

	Justified calls				Unjustified calls		
Month	Falls/Illnesses	Services (toilet, …)	Other	Errors	Attempts	Other	Total
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

Table 13.1: Categories of distress calls[2]

For the fire brigade, 'justified' calls are those which correspond to a real health-related emergency and which require sending someone out 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 13.2).

[2] Annual summary of remote distress calls supplied by the fire brigade's listening station

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

Table 13.2: Responses to remote distress calls

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 90% rate of 'unjustified distress calls' is widely cited and contributes to a very negative representation of this service. Asked for an evaluation of the remote distress call service, professionals start by saying: *it doesn't work*. Beyond the official figures, those in charge of the fire brigade listening station emphasise the incompatibility of the fire brigade's duty with 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 that it should respond and provide support for emergency callers in cases that comply with the initial intentions of those who designed the service - such as the case of an elderly person who, after a fall, breaks the neck of his or her femur - because this concerns an urgent medical need. On the other hand, when other emergency callers with other age-related problems call, the fire brigade is far less eager 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, by giving very elderly people the chance to speak when they feel the need to, remote assistance services have 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, 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, highlighting the downside of ageing. Manufacturers have looked into various, more discreet solutions. 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. For 'convivial' calls, 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 to deal with specific problems linked to very old age. These operators must know how to respond to emergency calls and to health problems, in addition to giving information about their services, and trying to respond to these people's social distress and low spirits. This demands a 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, to embrace 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-organise the mobilisation of those close to the elderly or to go back to the drawing board to assess what help the elderly really needed. 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 (Pennec and Trellu, 2005). 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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CHAPTER 14

A systemic evaluation of obstacles preventing the wider public benefiting from and participating in the broadband society

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Introduction

According to the Memorandum of Understanding, the objectives of the Cost 298 Action were defined as follows:

(1) to examine the modalities in which users actually use information and computer technologies (ICTs), to discover their current forms of creativity;

(2) to look ahead to technology related developments in the more medium term;

(3) to suggest new approaches and methodologies for constructing a more user-driven model of innovation in order to overcome the limitations of current models of 'user-centered' development;

(4) to produce a new phase in interdisciplinary cooperation.

To achieve these goals, the Cost 298 community must ensure that the public at large uses broadband technologies widely and effectively. To achieve that goal, a co-laboratory has been organised to define possible obstacles that prevent meeting this target.

Method

The Structured Design Process (SDP) methodology was chosen to serve the needs of the COST 298 community. An SDP co-laboratory is specifically designed to assist inhomogeneous groups to deal with complex issues in a reasonably limited amount of time (Banathy, 1996; Warfield and Cardenas, 1994). It enables the integration of contributions from individuals with diverse views, backgrounds and perspectives through a process that is structured, inclusive and collaborative (for a complete review see Christakis and Bausch, 2006). A group of participants, who are knowledgeable of the situation are engaged in collectively developing a common framework of thinking based on consensus and shared understanding of the current state of affairs. The SDP promotes focused communication among the participants in the design process and their ownership of and commitment in the outcome. In sum, an SDP co-laboratory provides an excellent opportunity for experts, to not only expand their shared understanding of

[1] The authors would like to thank Aleco Christakis and Patrick Roe for their valuable comments and contributions during the preparation of this chapter and Christakis along with CWA Ltd. (www.LeadingDesign.org) for providing their proprietary software Cogniscope for use in this co-laboratory.

the current *problematique*, but moreover to develop a roadmap for their future work and achieve a consensus as to how to move forward.

The first two authors have extensive experience in the method and have used it in many other analogous forums to facilitate organisational and social change (Hays and Michaelides, 2004; Laouris, 2004; Laouris and Christakis, 2007; Laouris and Michaelides, 2007, Laouris et al. 2007).

The specific objectives set for this Cost 298 co-laboratory were:

(1) to create a shared understanding regarding the obstacles that prevent the general public exploit broadband technologies (referred to as the *problematique*);

(2) to build commitment within the COST 298 community to an action agenda for collaboratively addressing the 'system of obstacles;

(3) to serve as a model for other European networks working on complex problems.

A slight variation of the methodology was applied, inspired by previous work (Laouris and Michaelides, 2007; Laouris and Christakis, 2007), in which the authors attempted to exploit virtual communication technologies to reduce the time required to obtain results. This involved the following steps:

The third author, in consultation with other experts of the Cost 298 community, formulated a *triggering question* three weeks before the face-to-face phase of the co-laboratory. The triggering question was sent by email to all participants in order to stimulate their interest and encourage them to begin generating their ideas before the actual co-laboratory. It also served to reduce the time required to explain the methodology at the onset of the workshop. The triggering question was: *What are the obstacles to the wider public benefiting from and participating in the broadband society?*

During the following weeks and until the day just before the workshop, participants were allowed to forward their ideas in writing by email sent to the authors. All ideas were recorded by the authors, entered into the Cogniscope program (see below), and a compilation mailed back to all participants just before the actual co-laboratory. The face-to-face part of the co-laboratory took place in a spacious conference room equipped with comfortable chairs, screen, computer, and beamer. The space, the surrounding walls (where messages can be posted) and the overall structure and organisation of the room was carefully chosen to meet the standards set by Christakis and Bausch (2006). Further details of the method are explained in connection with the presentation of their corresponding results.

Results

The results presented here stem from a co-laboratory, which took place in Larnaca, Cyprus on the 29th (4 hours) and 30th (4 hours) of September 2006. A total of 26 experts produced 82 factors in response to the triggering question. Table 14.l lists all factors perceived by the Cost 298 experts[2] as the most important obstacles, which

[2] Participants of the Cyprus (Larnaca, 29-30 September 2006) co-laboratory.

prevent the wider public benefiting from and participating in the broadband society. Participants have generated a total of 82 factors.

#	Factor	#	Factor
1	Inadequate definition of universal service	42	Poverty in the new Central and Eastern EU countries
2	Lack of infrastructure	43	Lack of self confidence in mastering the technology
3	Lack of consistent broad band knowledge	44	Too much time consuming and risk of addiction
4	Low level of digital literacy	45	Moral panic regarding the Internet
5	No attention on micro-barriers	46	Inertia
6	Lack of ease of use	47	Lack of user friendliness
7	Absence of specific services oriented to user needs	48	Poor interface design
8	Lack of time to adopt new technologies	49	Fear of techno-mafia
9	Existence of social inequalities (low income high costs)	50	Lack of software design capacity
10	Low educational level	51	Difficulties to choose between service packages
11	High cost of service	52	Fear of being watched by the Big eye
12	Lack of digital content in the mother language	53	Short-term national political decisions
13	General negative attitude against computers	54	Frustration because of the lack of reliability of the content
14	Lack of access in the personal formation process	55	Snobbism
15	Lack of competence towards ICT	56	Not having a computer
16	Social resistance to pay the broadband cost	57	Telecom focusing on 3G, whereas people on WiFi
17	The obstacles for the new Eastern and Central EU members are different from those of the Id members	58	Non use as deliberate lifestyle
18	Lack of interest	59	Age
19	Fear of intrusion and risk of falsification of personal data	60	Lack of understanding of advantages
20	Lack of awareness among politicians	61	Predictable male domination among users
21	Slow ubiquitous adoption on mobile phones	62	Fragility if IT systems
22	Underdevelopment of the ISP market in Eastern and Central European countries	63	Technological determinism
23	Flaws of technology in terms of hardware and content	64	Lack of consensus to fight against technological domination
24	Lack of user participation in ICT design	65	Bad software design
25	Lack of confidence in data security	66	Lack of organization of promotion activities
26	Fear of new technologies	67	Spam
27	Badly designed intellectual; property systems	68	Technology pushed (and not demand-pulled) services
28	Low perception of user relevance	69	Slow absorption of new technologies within organizations
29	Inability to predict benefits for individuals	70	Viruses
30	Inadequate promotion of its importance	71	Interference of health and safety regulations
31	Weakness of European coordination	72	Lack of understanding of the need to define the digital citizens rights
32	Lack of legal framework on broadband issues	73	Viability of existing technologies
33	Weakness of regulatory implementation of the legal framework	74	Lack of standardization of quality issues
34	Overestimation of the potential risks of the Internet	75	Ivory tower of humanist sociologists
35	Inadequate government policies on services to the public	76	Lack of interoperability between systems
36	Low individual interest about the content available on broadband	77	Other preferences, e.g. sports, TV, etc.
37	Bad prioritization: First technology, then content	78	Lack of open design interfaces
38	Lack of political organization of users and non users	79	Neo-phobia, the fear of the new
39	Resistance to learn new practices	80	Bad spam filters
40	Technophobia, the fear of technology	81	Fear of globalization
41	The too big power of technologists	82	Ethics

Table 14.1 List of factors

The next phase was implemented by a small number of four experts during the break. They were requested to cluster the factors in categories, using common attributes. They came up with 12 categories as shown in Table 14.2. The table was printed and handed over to all participants. They were given a few minutes to discuss and study the table. Subsequently, they were asked to choose the five factors they considered the most important. Their votes were counted and inserted into the Cogniscope software. Table 14.3 documents the prioritisation of factors, which resulted through this voting process. Using the method as explained above, participants were encouraged to engage in a

structured dialogue with aim to develop a 'map of obstacles'. The items were projected on the screen in pairs with the following Relational Question: *If obstacle X was successfully addressed, will that SIGNIFICANTLY support addressing obstacle Y?* During each comparison, the participants were engaged in a focused dialogue aiming to explore the particular relationship as it was projected on the screen. This usually presents an opportunity for participants to refine the meanings, uncover relationships and dependencies and generally to develop a much better understanding of the situation. This discussion also serves as an educational exercise, because it helps all participants achieve the same level of understanding and knowledge about the particular field.

The technique uses the simple mathematical concept of 'If A>B and B>C then we can safely assume A>C', to minimise the number of combinations needed to examine the influence interrelation between a number of statements in a reasonable amount of time. The fact that we are not dealing with quantities, but with ideas makes it necessary to go deep into the meanings of the statements thus supporting the process of creating a common knowledge base.

After going through all the necessary pair comparisons, a schematic presentation of the 'obstacles map' was created automatically by the Cogniscope™ software and projected on the wall. This inter-relationships diagram is given in Figure 14.1. This particular tree has six levels. The items shown at the top of the chart are those with the lowest influence. The ones with the greatest influence or the 'deep drivers', as they are usually referred to, are gathered at the bottom of the tree. This method of presenting the results makes the interpretation of the outcome of the participants' observations easy and visual. The deepest drivers are Factors 30 i.e., the inadequate public promotion of its importance and Factor 47, i.e., the lack of user friendliness. These are the obstacles, which must be addressed with priority. Their resolution will significantly help address all other obstacles.

The way to 'read' this map is by using the direction of the arrow: Resolving obstacle A – lower level – significantly enhances the possibility of addressing and resolving obstacle B – higher level. Items at the bottom of the tree must therefore be given higher priority and are usually easier to resolve. Their resolution has the greatest impact. The experts of COST 298 generated this tree partly during their co-laboratory in Cyprus in September 2006 and partly during their Lisbon meeting October 2007.

Discussion

The greatest value of this methodology lies in its power to identify the root causes of a problematic situation and to highlight the ideas that are most influential when one attempts to achieve progress. We will therefore begin the interpretation of the results with a discussion that focuses on the 'deep drivers', i.e., the items that appear at the root of the map.

According to the collective wisdom of the COST 298 community, the deep drivers, or the root-causes that prevent the wider public from benefiting from and participating in the broadband society are four from Level VI:

Factor #35: Inadequate government policies on services to the public
Factor #78: Lack of open design interfaces
Factor #24: Lack of user participation in ICT design
Factor #41: The too big power of technologists

Three from Level V:

Factor #30: Inadequate public promotion of its importance
Factor #33: Weakness of regulatory implementation of the legal framework
Factor #48: Poor interface design
Then if we can consider Level IV as deep factors:
Factor #19: Fear of intrusion and risk of falsification of personal data
Factor #15: Lack of competence towards ICT
Factor #52: Fear of being watched by the big eye
Factor #47: Lack of user friendliness

This result helps the COST 298 community focus its activities towards two directions. One, approach and work more with the designers and developers of new technologies in order to encourage them pay more attention to user friendliness. The second direction involves public bodies, media and decision makers to promote more enthusiastically its importance and benefits. This map is not to be considered as a rigid map. Moreover, the map must be seen as the collective consensus mapped on paper in ways that enable the stakeholders discuss and plan their action. The stakeholders have the right and the possibility to review issues, re-do some of the structuring and place more elements on the map. For example, in some cases it is possible that elements in one of the clusters have not received any votes and are therefore not included in the map. If the group feels that they are still important factors, they may add a few elements in the system and continue the structuring process to place them in their map. The stakeholders remain always in control and they are the owners of their data.

Placement of factors with highest votes in the influence map

The experts in the COST 298 community perceived factors 4, 9, 18, 7, and 26 as the most significant. During the voting process, these factors received 12, 9, 9, 8, and 7 votes respectively. It is interesting to analyze where these factors that were identified as being the most important, were finally placed in the influence tree of obstacles. The instinctive expectation is often be to think that they will prove to be root causes and would therefore be the first issues that need to be addressed. This is clearly not the case: of the five factors that received the most votes, three are in the third layer (factors 9, 18, and 26); two are in the first layer (factors 4 and 26). This means that during the structuring phase of the SDDP, the 'collective wisdom' of the experts favored other factors as having priority to be addressed first. Herein also lays a particular strength and value of this methodology. It yields a structured road map, that none of the individual experts could have foreseen, let alone drawn up, showing the order in which the obstacles need of be tackled in order to address the triggering question. The preliminary results of this co-laboratory were presented by Laouris, Patrick and Sapio at the trans-disciplinary conference organised by COST Action298 in Moscow in 2007.

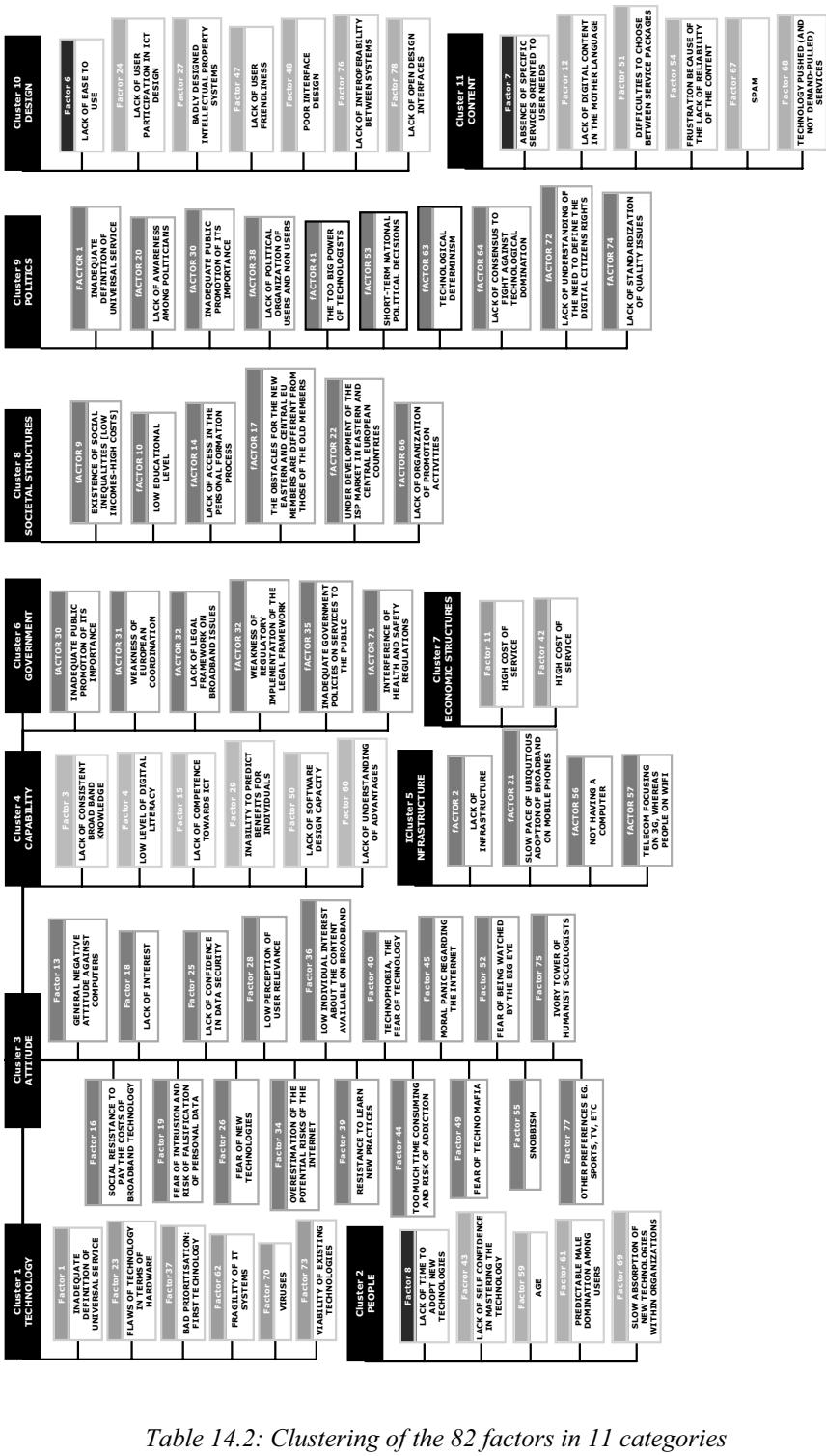

Table 14.2: Clustering of the 82 factors in 11 categories

The numbers in the left column correspond to the numbering performed for the coding of the proposed factors (i.e., same as in Table 14.1). The middle column contains the number of votes each element enjoyed. One element received 12 votes, two received 9 votes, one received 8 votes, one received 7, two received 6 votes, two received 5 votes and three elements received 4 votes each. All factors were used (some in Larnaca, some in Lisbon) to structure the influence map shown in Figure 14.1.

#	Votes	Factor
4	12	Low level of digital literacy
9	9	Existence of social inequalities (low income high costs)
18	9	Lack of interest
7	8	Absence of specific services oriented to user needs
26	7	Fear of new technologies
2	6	Lack of infrastructure
11	6	High cost of service
10	5	Low educational level
47	5	Lack of user friendliness
30	4	Inadequate promotion of its importance
36	4	Low individual interest about the content available on broadband
39	4	Resistance to learn new practices
16	3	Social resistance to pay the cost of broadband technology
19	3	Fear of intrusion and risk of falsification of personal data
24	3	Lack of user participation in ICT design
40	3	Technophobia, the fear of technology
45	3	Moral panic regarding the Internet
48	3	Poor interface design
57	3	Telecom focusing on 3G, whereas people on WiFi
63	3	Technological determinism
12	2	Lack of digital content in the mother language
15	2	Lack of competence towards ICT
17	2	The obstacles for the new Eastern and Central EU members are different from those of the ld members
29	2	Inability to predict benefits for individuals
32	2	Lack of legal framework on broadband issues
33	2	Weakness of regulatory implementation of the legal framework
35	2	Inadequate government policies on services to the public
41	2	The too big power of technologists
43	2	Lack of self confidence in mastering the technology
58	2	Non use as deliberate lifestyle
68	2	Technology pushed (and not demand-pulled) services
77	2	Other preferences, e.g. sports, TV, etc.
1	1	Inadequate definition of universal service
6	1	Lack of ease of use
13	1	General negative attitude against computers
25	1	Lack of confidence in data security
28	1	Low perception of user relevance
44	1	Too much time consuming and risk of addiction
46	1	Inertia
50	1	Lack of software design capacity
52	1	Fear of being watched by the Big eye
53	1	Short-term national political decisions
56	1	Not having a computer
60	1	Lack of understanding of advantages
62	1	Fragility if IT systems
67	1	Spam
72	1	Lack of understanding of the need to define the digital citizens rights
74	1	Lack of standardization of quality issues
76	1	Lack of interoperability between systems
78	1	Lack of open design interfaces

Table 14.3: Prioritization of Factors.

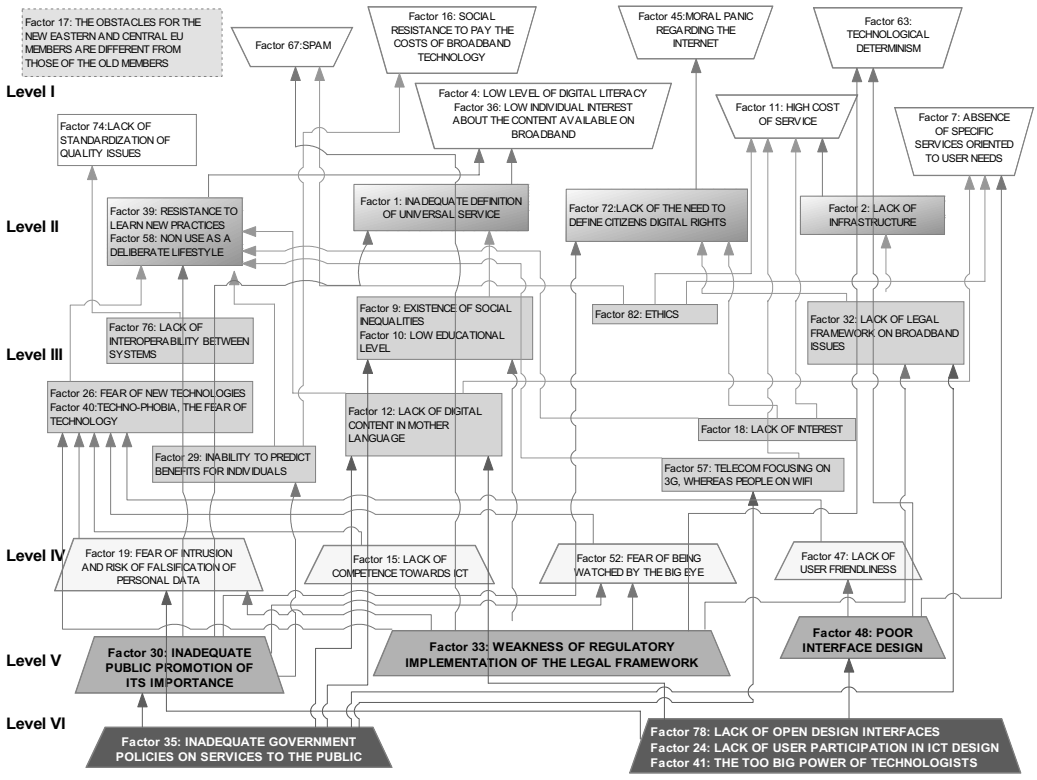

Figure 14.1: Influence tree of obstacles

Critical assessment and limitations of the method

A SDDP co-laboratory is specifically designed to assist a group of stakeholders to deal with a complex problem in a reasonably limited amount of time (Banathy, 1996; Warfield and Cardenas, 1994). It uses structured democratic dialogue to enable the integration of contributions from individuals with diverse views, backgrounds and perspectives. The process is inclusive and collaborative (for a complete review see Christakis and Bausch, 2006). It has been applied to over 600 complex problems around the globe. According to one of its founders, Aleco Christakis, the level of success in these co-laboratories was over 90%, therefore securing a very high confidence level. The methodology is, however, bound to fail if either one of its six laws is violated, or if the stakeholders are not truly engaged. Indeed, the first author, working with Christakis, has recently proposed a new constrain (i.e., the 'Law of Requisite Action'), according to which 'the capacity of a community of stakeholders to implement a plan of action effectively depends strongly on the true engagement of the stakeholders in designing it.' In other words, disregarding the stakeholders is not only unethical, but moreover it guarantees that the plans are bound to fail.

The SDDP is scientifically grounded on seven laws of cybernetics recognized by the names of their originators. If any of these laws is violated in the process, the

results will deteriorate. Ashby's Law of Requisite Variety (Ashby, 1958) calls for appreciation of the diversity of observers (i.e., invite 'observers' with diverse views). Miller's Law of Requisite Parsimony (Miller, 1956; Warfield, 1988) emphasizes the fact that humans have cognitive limitations, which need to be considered when dealing with complex multi-dimensional problems. This is secured by the fact that participants are asked to focus on one single idea or one single comparison at a time. Boulding's Law of Requisite Saliency (Boulding, 1966) calls for comparisons of the relative importance across ideas proposed by different people.

This is secured through the voting process. Peirce's Law of Requisite Meaning (Turrisi, 1997) says that meaning and wisdom can only be achieved when the participants search for relationships of similarity, priority, influence etc. within the set of ideas. Tsivacou's Law of Requisite Autonomy in Decision (Tsivacou, 1997) guarantees that during the dialogue, the autonomy and authenticity of each person contributing ideas is protected and distinctions between different ideas are drawn as a method of deepening our understanding of each idea. Finally, Dye's Law of the Requisite Evolution of Observations (Dye et al., 1999) tells us that actual learning occurs during the dialogue as the participants search for influence relationships.

The SDDP method is designed to fully implement the first six laws, but if they are compromised, the results are bound to suffer. The recently discovered seventh Law of Requisite Action (Christakis and Laouris, 2007) asserts that the capacity of a community of stakeholders to implement a plan of action effectively depends strongly on the true engagement of the stakeholders in designing it. The accompanying Engagement Axiom (Özbekhan, 1969, 1970) states that designing action plans for complex social systems requires the engagement of the community of stakeholders in dialogue. Disregarding the participation of the stakeholders is unethical and the plans are bound to fail. In accordance with the Tree of Action the first six Laws are necessary, sufficient and ethical requirements for satisfying the Law of Requisite Action (Laouris et al, 2008).

In sum, a SDDP co-laboratory provides an excellent opportunity for experts, to not only expand their shared understanding of the current *problématique*, but moreover to develop a roadmap for their future work and achieve a consensus as to how to move forward.

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CHAPTER 15

Broadband development: The importance of enablers and constraints for a consistent strategic policy making

Peter Trkman, Borka Jerman Blažič and Tomaž Turk

Introduction

In recent years technological and market developments have contributed to quick growth in the adoption of broadband (BB) in the EU – a topic that is also attracting growing political attention. Several project and initiatives have been undertaken to further enhance technology and to deliver state-of-the-art solutions to consumers.

But are our policies for strengthening the adoption of BB appropriate? Should we focus not only on the most appropriate and economically efficient technologies in a short run but also try to understand the complex relationships within the mix of technologies, services and user needs? Is there any evidence of enablers and constraints? And how to combine them to a consistent set of governmental and regional strategic development policies?

There is still a long way ahead to achieve the key message of the current EU initiatives – the focus on the strategic objective of 'Broadband for all'. This can also be seen from Figure 15.1 that depicts the relationship between the growth of BB penetration in 2003-2006 and the current level in 2006 and shows that both penetration and growth levels are quite uneven across Europe.

The figure nicely illustrates the fact that the OECD leading countries (Denmark, Netherlands, Norway) are quickly catching up/overtaking Korea in terms of BB penetration levels. A few outliers (such as UK and Australia) are trying to close the gap to the leading group, while the majority is following a similar path. Still a few countries (Greece, Slovakia, Poland) do not experience considerable rates of growth.

Similarly, the analysis in Trkman at al. (2007) showed that, while GDP is the most important predictor of BB penetration, several countries have far higher (Korea, Finland, Denmark, Netherlands) or lower levels (USA, Ireland, Greece) of BB adoption than predicted by their economic development.

However, even though rankings matter, because leading-edge nations are likely to be more economically competitive (Atkinson, 2006), increased attention on the BB adoption levels can blur the other, probably even more important, aspect – namely the usage of services and the benefits BB should bring to individuals, companies and society as a whole. Unfortunately, technology/ infrastructure development alone is not enough to guarantee the adoption of BB technologies and services by the inhabitants of a certain region. Use, not just access, is crucial (Chen et al., 2002). It can be claimed that widespread deployment is a necessary but not a sufficient condition for the widespread BB development (defined for the purpose of this chapter as the use of BB technology & services (Trkman at al., 2008).

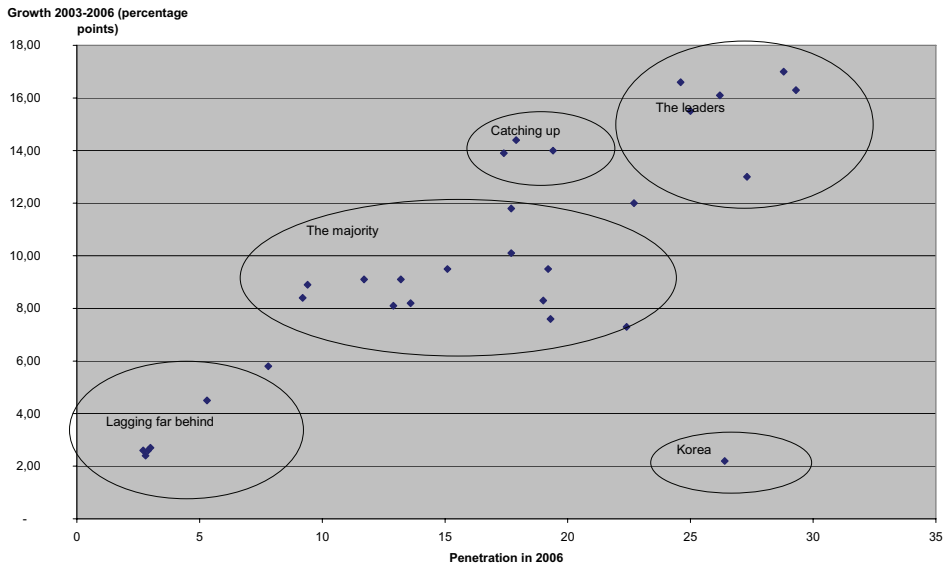

Figure 15.1: Growth and current state of BB penetration[1]

In this chapter we will concentrate on residential access although the access of companies, especially small and medium-sized companies, is also an important topic; even for increasing residential access, since people who use BB at work are more likely to adopt it at home (Hollifield and Donnermeyer, 2003).

We firstly summarise previous research findings. In the next section factor and correlation analyses of BB development are presented. A strategic policy framework is then developed, described and applied to the case study of Finland national BB strategy.

Background and motivation

Several researchers have undertaken the challenge to identify additional influences on BB adoption levels. As mentioned earlier economic wealth (measured as GDP per capita, personal income etc.) is usually the main predictor of BB adoption (or Internet adoption in general).

Unsurprisingly, the price of BB access is usually found to be the second-most influential variable, while effective regulation is also often found to contribute significantly to the adoption level. On the other hand, the research results differ in findings of the importance of other factors such as:

– Education level: more educated people should have higher incomes and also a greater inclination to accept new technological solutions. However, several studies

[1] Data source: OECD; own interpretation.

in recent years (e.g. Baliamoune-Lutz, 2003) have found no correlation between education level and BB adoption on a national level.

- English language proficiency: since most web pages are in English, people in countries or regions with better knowledge of the English language should be more inclined to invest in new technologies. However, the amount of content in other languages is increasing; also the required level of English proficiency to surf the web is not very high. Newer studies (e.g. Kiiski and Pohjola, 2002) usually do not find a correlation between Internet adoption and the languages spoken in a particular country

- Level of democracy/political system: less democratic countries often try to stifle the development of the Internet as this could reduce their autocratic power. See e.g. (Milner, 2006) for an interesting analysis of the political factor and country's regime on BB adoption

- Age: younger people usually adapt new technologies quicker and integrate them into their everyday lives. Therefore several surveys have shown that the majority of users hail from the young and middle-aged groups; however the older age group consists of mainly non-adopters (Choudrie and Dwivedi, 2006).

Appeal of the content: last but certainly not least – a wide array of available and attractive services, especially but not limited to those that require large bandwidth, is one of the main stimulations to upgrade from dial-up access.

Sometimes even further influences were found – such as the influence of religion/culture (Beilock and Dimitrova, 2003; Erumban and De Jong, 2006), credible payment channels (Oxley and Yeung, 2001), social networks (Madden and Simpson, 1996) or human capital and the importance of trade (Caselli and Coleman, 2001)[2] to mention just a few of several studies and identified influences. Indeed stimulation of BB development poses a policy problem related to the use and deployments of ICTs with multiple geographic, social, economic and organisational components (Baker, 2005).

The wide variety of studies, approaches and identified influences illustrates the complexity of the subject and leaves one to wonder which study to take into account and which actions to take in order to achieve higher BB development levels. Secondly, previous studies often concentrate on BB adoption rather than usage and do not reveal interplay among various indicators (Dutta and Roy, 2004/2005). Further, those studies usually stop at the identification of influential variables but do not provide any guidance for decision-makers in companies or governmental bodies.

Our approach to studying these issues brings two important benefits: it reduces the vast number of studied variables to three separate but inter-connected factors and it provides some strategic guidance for creating or assessing strategies to achieve BB development.

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[2] The latter studied the adoption of computers in general. Their findings are also relevant since computer is a prerequisite for BB adoption and the overcome of digital divide in computer ownership is believed to be one of the more efficient approaches towards stimulation of BB adoption (Stanton, 2004).

Analysis and discussion

We tried to identify the underlying factors that are common among a chosen set of BB development indicators in EU-25 countries. The main advantage of this approach is that no prior assumption is made about the number of factors to be extracted or the distribution of variables.

To achieve this, we selected a set of variables at the country level while focusing on countries within the European Union. We used a dataset from Eurostat (Eurostat, 2006) for 2004. Based on a thorough review of previous work in this field, a specific set of variables that reflect the situation in EU-25 countries was selected – those variables are most often mentioned as important indicators of BB development (see Jerman-Blažič et al. 2007) for analysis of included variables and reasons for their inclusion). The complete list of variables can be found in Trkman et al. (2008). France and Malta were excluded from the analysis since many values in the Eurostat data were missing for them so the dataset contains 23 cases. We used mean-corrected data in our further calculations.

First we studied the correlation between each variable pair – an approach that is often neglected in other studies. The correlation analysis showed that the variables are relatively well-related. Since we are interested in BB penetration we checked for any extraordinary results in comparison to the findings of other similar studies. For instance, we noticed that some variables which are often regarded as BB stimuli (like Internet gaming) are not directly correlated to BB. This could mean that while Internet gaming/downloading music does account for the majority of traffic on the Internet[3], it is not one of the main incentives for BB uptake. This is in line with the finding in (Park and Yoon, 2005), that found entertainment as a main killer-application for early adopters, but lists e-business as a main incentive for the uptake of the majority. Most EU countries have obviously entered the second phase. Therefore we believe that the answer to the question 'whether broadband diffusion is due to killer applications driving broadband demand or due to users' mature use of Internet' (Ferro et al., 2007) is certainly in mature and extensive usage of BB and its 'always-on' connectivity.

After that factor analysis was conducted (see Trkman et al., 2008) for a detailed description of applied methodology and the results). The results of the factor analysis revealed three factors. The interpretation of these factors depends on the strength of their relations with observed variables. According to this, the three factors may be interpreted as:

(1) 'enablers & incentives', including the variables BB penetration (INT-BB), telework usage (TELEWRK), household income (HH-INCOM), BB service price (BB-PRICE).

(2) 'Usage of information services', including the variables Internet usage for information retrieval (INT-INFO), Internet usage for gaming (GAME).

(3) 'ICT sector environment', including the variables communications technology expenditures (CT-EXP), population density (POP-DENS), education level (EDU-LEVEL) and Internet access over the phone (INT-DIAL).

[3] Peer-to-peer communications account for 50-70% of online traffic, while playing games should account for more than 30% of USA traffic by 2007 (Whitman, 2004).

The interplay between factors and variables is presented in Figure 15.2 (BB penetration is emphasised), where variables are grouped together if they are related to the same factors. The arrows denote a factor's direct relationship with these groups. Statistically stronger relations are represented with thick arrows. BB development indicators with negative correlations to related factors are shown with a dashed border.

We can see that three groups of variables are strongly bonded to corresponding factors (like Internet usage for gaming and information retrieval to the factor 'usage of information services'). These groups explain the nature of the factors. Other 'mixed' groups of variables are connecting two factors together, like frequency of Internet and PC usage (INT-FREQ, PC-FREQ), IT expenditures (IT-EXP) and electronic purchasing (E-PURCH) connect the factors 'usage' and 'enablers & incentives'. These groups show how the factors are related to each other. For instance, the PC and Internet access mixed group (PC-ACC, INT-ACC) shows that, for enablers and incentives to be successful, the development of infrastructure is important not only in a technological sense but also in the form of the acceptance of previously developed technologies.

The 'enablers & incentives' factor is strongly connected to economic factors like household income and BB service prices, with the latter being negatively correlated (this was expected; the higher the prices the lower the value of this factor). The mixture of these economic indicators provides information about the influences that enable people to use advanced ICT services. This factor also includes variables (BB penetration and telework) which directly express the means and strong incentives for access to information services. Telework is obviously more than just the intensive use of services and it is also not an information service but rather its foundation. It also requires a new job organisation paradigm (Perez et al., 2002) and poses several non-technology-related questions (Kurland and Bailey, 1999).

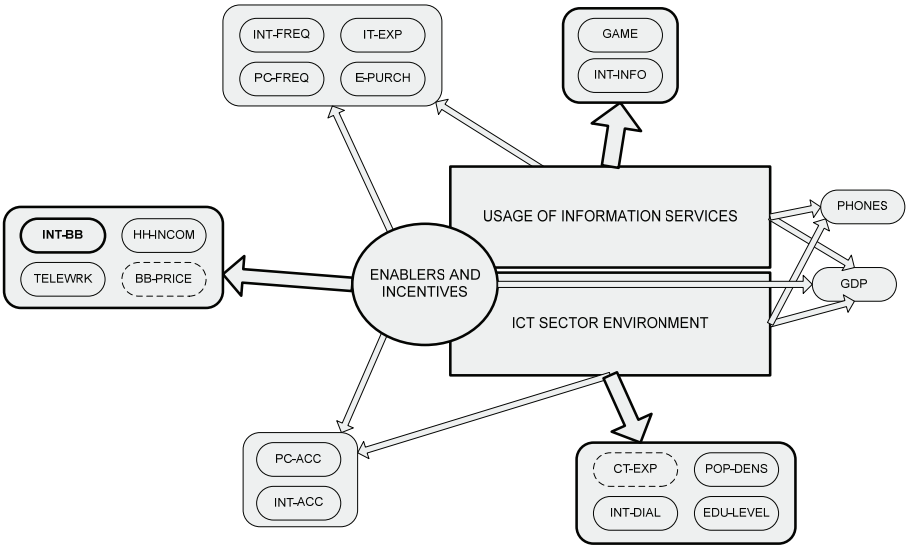

Figure 15.2: Structure of relationships between variables important for the adoption of BB

The ‘usage of information services’ shares some variables with the enablers & incentives factor (electronic purchasing, IT expenditures, frequency of PC and Internet usage). This shows that these variables reflect both enablers & incentives and the usage of information services.

The ‘ICT sector environment’ factor is connected to indicators which show the state of the ICT environment within a country (like communications technology expenditures, population density, education level, Internet access over the phone). PC and Internet access are also related to enablers & incentives. Variables such as population density and education level greatly influence the ‘absorption capabilities’ of the given society. Low population density presents additional costs for telecommunication service providers and a low education level may affect the adoption processes. On the other hand, expenditures on communication technologies (CT expenditures as a percentage of GDP) are only correlated with the third factor (ICT sector environment), but negatively. Behind these findings probably lies the fact that countries with less developed CT sector have relatively large investments for providing the core communication infrastructure.

GDP per capita (GDP) is almost equally distributed among all three factors. This confirms the findings of previous researchers that economic development lies behind all the studied factors – unsurprisingly ‘GDP is everywhere’. The split in the number of phones variable (PHONES) between the second and third factors shows a similar structure – the use of information services by citizens and the infrastructural development within each country.

The actual use of services is obviously very important. ‘Use not just access’ is crucial because the requirements of broadband services and applications will drive the next phase of the development (Houghton, 2003). The composition of the first two factors confirms this claim. On one hand, the first factor expresses economic enablers (household income and BB service price), strong incentives (telework) and means of access (BB penetration, PC and Internet access). On the other hand, the second factor is connected to variables that measure the actual use of services.

Although many experts claim that no ‘killer-application’ has been developed to justify the price of BB, the cumulative effect of improved possibilities for services usage may be sufficient to replace a ‘killer-application’ as a motivation to adopt BB (Savage and Waldman, 2005). Our research confirms this thesis and emphasises the importance of the wide mix of services that are in use.

Framework development

Government at different levels are not satisfied with the speed of adoption process. This is vital since BB access is not simply a consumer good, but rather a mean of citizens cooperation in the society (Van Winden and Woets, 2004). Internet is becoming a significant component of society’s communications structure (Gillet et al., 2004). Together, the potential benefits at the national, individual and organisational levels contribute to something of a consensus that the adoption of BB should be promoted (Xavier, 2003).

The classic approach of encouragement of infrastructure development, seems to reach its limits (Ramos et al., 2004), therefore governments and other stakeholders (e.g. service, infrastructure providers etc.) have to pay attention to the various factors that

influence BB adoption and usage levels. Understanding the underlying logic of BB adoption is therefore crucial for them in preparations of their strategy/business model and to justify the costs of investment in a new technological solution or their deployment.

It is important to bear in mind that meaningful analyses require a conceptual framework (Vicente Cuervo and Lopez Menendez, 2006) that has not previously been developed. It is obvious that a strategic framework must address all factors identified in the previous section along with a combination of different policies.

This is reflected in the proposed framework that has two main dimensions:

(1) Influencing factor: which of the three factors does the action attempt to influence?

(2) Type of influence: in general, the economic laws of supply and demand also apply to the adoption of BB technology and services . Therefore, either demand- or supply-side stimulation (Frieden, 2005; Cava-Ferreruela and Alabau-Munoz, 2006)[4] can be used:

- supply-side: to either influence the business orientation and diversity of the business models of providers with incentives or other actions (supply-side economic influence) or to directly influence the supply-side with legislative or regulative acts (supply-side social influence) or
- demand-side: to increase the demand for services by consumers either the real(demand-side economic influence) or perceived (demand-side social influence) value of BB should be increased.

See Turk at al. (2008) and Breath (2007) for a detailed description of policies that can be used in various quadrants of the framework. It does seem that a general consensus is that stimulation of competition is the best way to influence all three factors in the framework, while the entry of new firms influences both the demand and supply side (Agarwal and Bayus, 2002). For example, new entrants in the market can increase e-awareness due to an increase in promotional activities (Agarwal and Bayus, 2002), while competition is also one of the important incentives for using services (Hackney et al., 2006). Therefore, effective competition and the continued liberalisation of infrastructure, network services and applications were recommended as being crucial to stimulating broadband development (OECD, 2004). While a full analysis of the effects of competition would be beyond the scope of this chapter - see e.g. Cave et al. (2006) for a review of various issues - we point out some of the most relevant areas for policy-makers.

On the supply side, regulation at different layers (Mindel and Sicker, 2006) is important. Access to infrastructure, competition between different technologies (Fransman, 2006) and the relationship between content and infrastructure providers has attracted most attention in the regulation/promotion of competition. Local Loop Unbundling (LLU) is another important issue since it can offer BB access to end-users for entrants without their own local networks (Fransman, 2006). Therefore, LLU is likely to lead to more competition probably faster than would have happened without regulatory intervention (De Bijl and Peitz, 2005). See De Bijl and Peitz (2005) for an

[4] Combination of demand and supply side influence has also been identified as crucial for a development of BB showcase – South Korea (Han, 2003).

overview of EU countries' experiences with unbundling, while limited success in LLU has been identified as one of the main reasons for Ireland's lag in adopting broadband (Analysis White Paper, 2006).

type of influence / influencing Factor	I supply-side economic policies	II supply-side social activities	III demand-side economic policies	IV demand-side social policies
1. enablers and means	e.g. economic development; price caps for BB services	e.g. legislation in support of e-business/telework; universal service obligations	e.g. improved access to PCs; tax incentives for investment in PCs, Internet connection	e.g. general increase of e-awareness, encouragement of the usage of telework
2. usage of information services	e.g. support of service development; public-private partnerships	e.g. development of C2G and B2G services	e.g. encouraging of C2G	e.g. increase of e-services awareness; education
3. ICT sector environment	e.g. techno-economic modelling; public-private partnerships	e.g. regulation (different sorts)	e.g. actions to decrease switching costs	/

Figure 15.3: Strategic framework[5]

However, competition alone cannot guarantee widespread adoption of BB. Early competitive telecommunications providers tend to 'cherry pick' in the largest markets (Malecki, 2002), therefore the progress of competition in rural areas has often been slow (Fuentes-Bautista and Inagaki, 2006). Even further: it has been shown in Foros and Kind (2003) that competition can in fact lead to lower welfare for rural areas in a (usual) case of uniform prices in the whole country.

We could summarise that policy questions could be 'how to create a co-evolutionary dynamism by means of ICT innovation, enriched functions, reduced price and competitive environment' (Chen and Watanabe, 2006).

Case study – Finland National BB Strategy

Finally, the suitability of the framework was tested with the application on a case study of Finish national Broadband Strategy (Government Resolution on Finland's National Broadband Strategy, 2004). According to (IMF World Economic Outlook Database,

[5] Source: Trkman et al. (2008).

September 2006) Finland is 11th in terms of GDP per capita (37.504 $) and is in 7th in 2006 e-readiness rankings (Economist Intelligence Unit, 2006). Finland is one of the leading ICT producers and also one of the leading countries in terms of 'New Economy' (Jalava and Pohjola, 2002). ICT has grown substantially during the past decade. In the beginning of the 1990s, Finland was one of the least ICT-specialised industrial countries; now its amongst the most ICT-intensive countries in the world (Koski et al., 2002).

Finns have been considered to have very positive attitudes towards new technologies. The share of broadband households was about 10% in the year 2002, ca. 13% in the year 2003, 25% in the year 2004, and already about 40% in the year 2005 (Frank and Hirvonen, 2006). Fixed BB infrastructure networks (along with mobile telephony) today constitute the key ICT 'backbone' infrastructures for the further development of the Finnish model of the knowledge economy (Dahlman et al., 2006). Recent data show that now already over 95% of the households could get broadband. At present about 50 % of households has actually purchased a broadband connection (Kohtala, 2006). On the other hand, business-government transactions performed over the Internet are on the rise and are a key ingredient of success (Economist Intelligence Unit, 2006). According to an analysis in Bouras et al. (2004) Finnish politics can be considered above average in most categories (except price and obviously the growth rates).

Finnish Internet users do not differ markedly from other leading Internet nations in service usage patterns. (Dahlman et al., 2006). This fact can also be observed in (Eurobarometer, 2006) where exceptionally high usage of finance services can be observed – Finland is and has historically been world-leader in e-banking (Karjaluoto, et al., 2002).

However, regional digital divide is still a problem: The peripheral regions in the northern and eastern parts of the country have been increasingly losing population and lacking entrepreneurship (Pelkonen, 2005). Some believe that the Finnish broadband policy has resulted in regional differences and spatially uneven impacts in terms of availability (Frank and Hirvonen, 2006).

We also conducted cluster analysis of EU-25 countries based on the previously found factors (Trkman et al., 2006). Finland has been distributed into groups B, A and C respectively. This means that Finland is among EU-leading countries in terms of usage of services, while close to the top in the 'enablers and incentives' factor. The relatively 'low' grouping in 3rd factor is mainly due to low population density, that lead to afore mentioned regional differences[6].

The 50 actions of national broadband strategy of Finnish government (Government Resolution on Finland's National Broadband Strategy, 2004) were distributed in the appropriate quadrants of the framework. The purpose of this section is not to provide a detailed overview of the situation or strategic efforts of a single country but to test whether the framework can be used to assess a previously developed strategy.

Action 20[7] was decomposed into demand and supply side social activities as it is a rather broad action. All other actions generally belong to a single quadrant. Actions 31,

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[6] It should be noted that cluster analysis should not be used for general ranking purposes but rather for identification of countries that might have similar critical success factors.

[7] »Municipal on-line services will be expanded substantially in line with the Government's Information Society Programme; a considerable proportion of municipal procurement will be handled online; all the

46-50 are support actions in implementing the strategy – mainly concerned with the provision of security and measurement of progress/realisation of strategy.

As seen from Figure 15.3 the Finish government is well-aware of the complexity of the strategy development and addresses most of the quadrants of the framework. Economic policies for demand stipulation were however not adopted and only few economic measures for supply-side are mentioned. It could be argued that Finland as one of the most economic developed country in the world does not need to provide additional economic incentives to its citizen in order to accelerate the adoption of new technological solutions or services. Nevertheless, some believe that the resignation from subsidies to the construction of BB infrastructure seems to have increased the regional differences between the Finnish regions (Frank and Hirvonen, 2006)

type of influence / influencing Factor	I supply-side economic policies	II supply-side social activities	III demand-side economic policies	IV demand-side social policies
1. enablers and means		3, 8, 9		21, 22, 23, 27, 28
2. usage of information services		5, 6, 13, 18, 19, 20/a, 26		11, 14, 20/b, 29, 30
3. ICT sector environment	1, 7, 16	2, 4, 10, 12, 17, 24		/

Figure 15.4: Finish government strategic action distributed in the framework

Additionally the analysis showed that the actions are well-defined and not too broad as each action (except one) belongs to a single quadrant. As such, the actions are also operational enough that their progress can be monitored (see e.g. Broadband Strategy: Interim Report 2: Implementation of the strategy, 2005).

Finally, the case study also showed the main enhancements needed in the framework. Firstly, a possibility to provide an overview of current problems (regarding each of the studied factors) and critical success factors for specific country/region should be included. Secondly, the framework should enable the inclusion of desired outcomes of each action along with a possible measurement instrument.

Thirdly (and probably less importantly) the classification of support actions (such as actions to increase safety[8]) should also be possible – probably as a 'bubble' around the framework.

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main municipal service processes will be charted; and joint services in public administration will be expanded substantially«.

[8] An example: the legislation on data protection in the workplace will be actively enforced once it has been enacted (Government Resolution on Finland's National Broadband Strategy, 2004).

Conclusion

In this chapter we dealt with the question of BB adoption and reviewed the current BB adoption in EU/OECD countries. Our research work showed that the majority of differences between those countries in terms of BB development can be explained with a combination of three factors. This finding was used in creation of a framework for assessing strategies in this area.

The analysis showed that the framework is a suitable tool, because all proposed actions of a national government of an EU country can be classified according to the framework. It does provide additional insights into the strategic planning of a government, serves as a tool to and identified areas that the proposed strategy is not tackling (i.e. economic support for demand side). The framework could also be used as a tool when preparing a new strategic plan. However, currently the previously developed framework (Trkman et al., 2008) only illustrates a point of time without the ability to list strategic needs and measure outcomes.

This area offers several interesting topics that need further research such as:

- the application of the framework to various case studies on national or regional level;
- further monitoring of situation and changes in the underlying factor structure;
- the further study of relationships between three factors and their influence on BB penetration.

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CHAPTER 16

Users in the information society: Shaping a 'golden age'?

Mijke Slot and Valerie Frissen

Introduction

In 2004, O'Reilly Media popularised 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 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 twenty-first 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. Gantz et al. (2007) state that 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.

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 for users to innovate. Not only are users actively consuming content, users also take on distribution roles in peer-to-peer (P2P) file sharing networks, and content creation roles in the case of user-generated content. Users actively rate and tag content (a phenomenon known as folksonomy), download content, share it, comment on it, and communicate about it with their peers (Slot, 2007). 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 chapter we shall explore these innovative roles of users. This exercise will enhance the understanding of the concept of Web 2.0 and subsequently the roles users take on in this development.

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

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 characterised by high deployment of a technology, but also by what Perez calls 'societal re-engineering' and 'creative destruction'. We will explain what these concepts mean and they will be used as guiding principles in our analysis.

In this chapter 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).

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 (selected and ranked according to generated traffic). 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 chapter we will present the first outcomes of the analysis.

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. 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). 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. 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

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

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, we will focus on (1) the deployment of Web 2.0 services, (2) ‘Societal re-engineering’ and (3) ‘Creative destruction’.

Deployment of Web 2.0 services

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 in other research about the uptake and impact of Internet technology. 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

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. While Picone in this book focuses on use practices in one single domain; news, we try to look at user roles more broadly. 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 by users 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: 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 the 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, 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 16.1.

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

Table 16.1: Role classification

Creative destruction

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 16.1. We will use these general business model levels as exploratory, heuristic concepts.

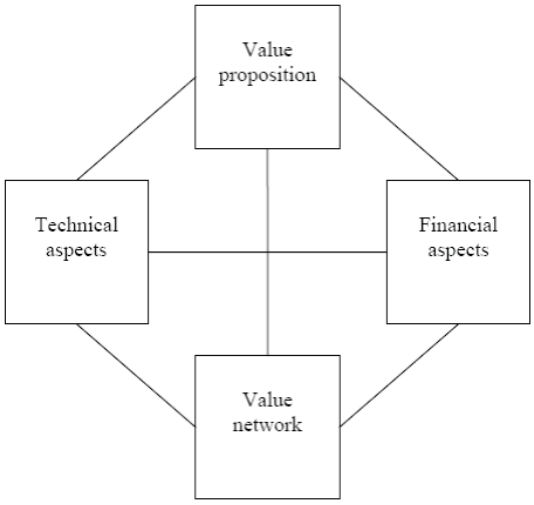

Figure 16.1: General business model levels, based on Osterwalder (2004)

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. (2007) already indicated that the Internet has become a huge database of information. However, it doesn't give any hints about the way this technology and this information is actually used. Many research institutions, for example 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. For example Pew shows that 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 and Fox, 2007: 3).

The various research data 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 and socio-economic impact of 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, they 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.

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 and 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 to 100 million or 200 visitors a month. 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 until 30.000 members. 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.

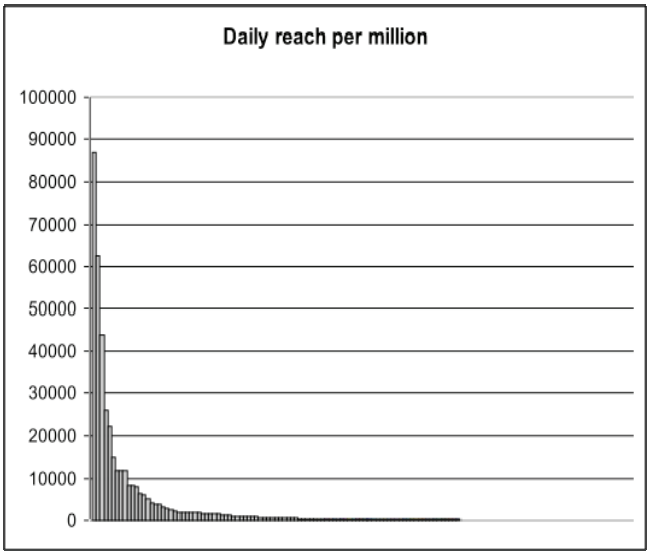

Figure 16.2: Daily reach of Web 2.0 services in case sample

A more structured indication of web traffic is provided by Alexa. This service 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 Figure 16.2). Considering 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.

The nature of Web 2.0 services

Besides estimating the uptake of these Web 2.0 services, it is also important to indicate the nature of the services we have been studying. Table 16.2 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. Social networking and community websites are also clearly present in the Web 2.0 domain. Also the services that provide user tools are often focussed on social aspects. Users can create their own social networks, make personal pages, personalise their start page and collaborate with others.

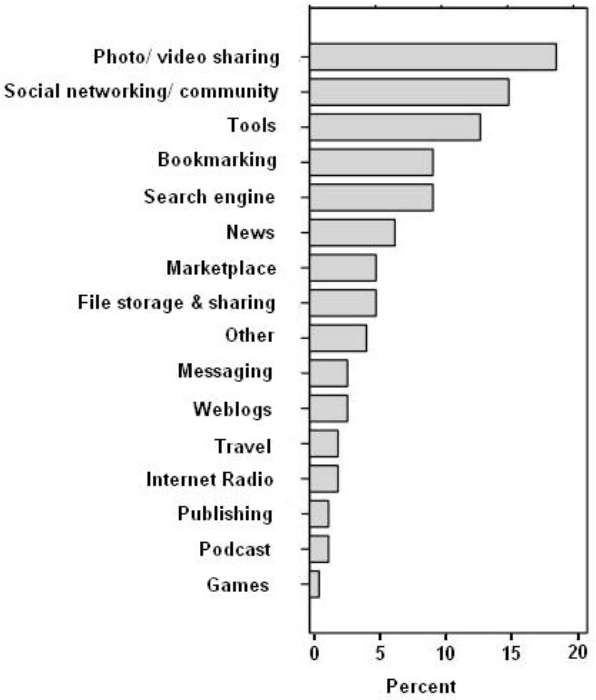

Table 16.2: Classification of Web 2.0 services (N=139)

Societal re-engineering

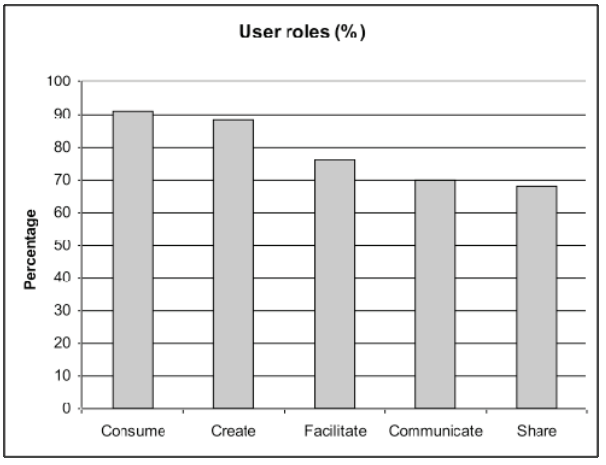

Figure 16.3: Classification of user roles in Web 2.0 services

In the introduction to this chapter, 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. Figure 16.3 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.

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 personalised search engines. Sixty-six 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. Thirty-two 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. Fourteen percent of the services provided audio content.

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. Customisation is a more limited form of user generated content because users are only allowed to *adapt* a service, existing content or products within given limits, pre-ordered by the service. In 35 percent of the services customisation was enabled. Often, users are allowed to customise 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.

Sharing

Web 2.0 services also enable users to share content and thoughts on a large scale. Sixty-eight 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. Almost one third of all services allow users to send their content or a link to their content directly to other users. However, there are only a few services that use a P2P network for sharing content. This indicates that these services are only semi-open.

Facilitating

In 76 percent of the online Web 2.0 services, users take on facilitating roles as well. By adding keywords (tags) to content, users make searching content more easy for others.

Almost half of all services (48 percent) allow users to tag content. Some services offer tagclouds; 'clouds' with keywords that show the most popular tags used for content provided in the service. The more often a certain keyword is used, the larger this word shows in the cloud. In 45 percent of all services, users can subscribe to each others content – or the content of the service. Often RSS feeds are used to accomplish this. Some services even let users burn feeds themselves. Twenty-five percent of the services allow users to filter or channel. They either can decide for themselves which users can view their content, or users can categorise their content into channels. Users can also recommend content to others. This is the case in 22 percent of all services.

These facilitating user roles are exemplary for the developments in the online domain. Social bookmarking has become very important. Instead of traditional taxonomies (central classifications of content) users are creating these classifications themselves. This activity has come to be known as folksonomy. Because users create metadata and help others to find relevant content, they have become information brokers themselves. This guiding and gate keeping task traditionally was taken up first and foremost by business parties.

Communicating

Communicating is another important feature of Web 2.0 services. Almost 70 percent has some sort of communication functionality. More than half of the Web 2.0 services allow users to comment on others. In 42 percent of all services, users can directly send a message to other users. Marking content is another activity users can take on in these services. In 35 percent of all services, users can give ratings; they can judge content – and even other users. Direct chatting is not as popular. Only 11 percent, offer users the possibility to directly chat with one another.

Active users in all parts of the value chain

The research outcomes indicate that users are enabled to fill in roles in all parts of the value chain. These developments are in line with various researchers that have pointed out that users are increasingly important. Toffler (1980) already indicated that users were combining their consuming role with producing tasks, for which he has introduced the famous phrase *prosumers*. Some years later, Leadbeater and Miller (2004) coined the term pro-ams, referring to amateur users who where more and more professionalizing their activities. Furthermore, Von Hippel (2005) has written extensively about the impact of users (lead users) on the innovation process in his book *Democratizing Innovation*.

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, organisation, 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 16.1. 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 chapter 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.

Revenue models

More than half of the services (67 percent) make money by placing advertisements on their websites (see Figure 16.4). 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. Twenty 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.

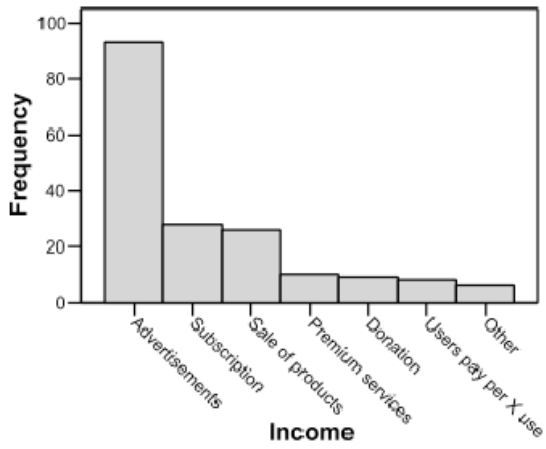

Figure 16.4: Revenue of Web 2.0 services

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 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. Some news websites, 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 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. Some bookmarking and recommendation sites, not only shares advertisement revenues, but also affiliate revenues when a user recommends a product from a commerce partner. The case sample also contained a 3D chat application where 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 built 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.

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 chapter, users are relatively free in Web 2.0 services to create content themselves, add things and personalise the services they use. The analysis of the case sample also shows that many services offer users the possibility to combine different services. 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.

Value network and value proposition

Many services strongly rely upon their users for value. 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 chapter? 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. Other services offer users their Application Programming Interface (API). 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.

Conclusion

We have started this chapter 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. 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 roles 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 or 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 - they sometimes 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 organisation 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.

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'. 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 stabilise 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 chapter is a first small step in this endeavour.

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Conclusion

This book is aimed at obtaining a better understanding of the ways users behave in the drivers' seat of creative destruction – potentially based on disruptive technologies – and of the development of new media and technology. Dourish (2006: 6) states that: 'Users (are) not passive recipients of predefined technologies, but actors who collectively create the circumstances, contexts and consequences of technology use.' This relates to the notion of 'user-centred design', or even better to 'people-centred design'. The latter term broadens the focus on task-centric users situated at the end of the product development cycle (e.g. relating to usability, user friendliness…) to a view of people in their social context as a fundamental source of innovation (Wakeford, 2004). In order to thoroughly understand users in this way, we need an interdisciplinary approach in user research – especially on digital media use – preferably combining the fields of innovation management, human-computer interface, sociology and media studies (Frissen and Pierson, 2004).

Therefore the core topic of this book deals with (innovating) people as users in current broadband society. *In what way are users innovators, is it possible to make them innovative and which factors have to be taken into account if we want to realise a European broadband society?* The chapters in this book give different insights, methods and angles to look at this issue. This is highly relevant as European and national policy makers are becoming fully aware of the need to place the user in the centre.[1]

Prologue: Everyday life

The start of every experience in human life is everyday life. Hartmann (chapter 1) shows us that the concept of everyday life is a complicated one in which the user gets all kinds of impulses, especially when talking about the 'networked everyday'. Everyday are the routines in people's lives and the conservative (preservative) nature of people's desires. At the same time this everyday life forms the basis of change and innovation. Everyday are the tensions in life and the perceptions of a more or less stable world of which the individual is a part. Everyday are also the influences of the media that communicate what should be and what should not be. All these different and often contradictory impulses play a role in the ways people are prepared to innovate and the type of innovation they choose in a changing ICT environment. This makes users' behaviour in the eyes of the developer and the policy maker often erratic and difficult to understand.

A logical way to cope with this problem is getting the user more involved in the creation and production of technology that is to be used by him or her. But what is it exactly that the user wants and how can the involvement take place?

[1] See for example the public-private initiatives on setting up user-oriented Living Labs in different EU member states, being united in the European Network of Living Labs, available at <http://www.Open livinglabs.eu>.

A model of choice: enablers and constraints

A key notion that plays a role in the discussion around adoption and use, is that it is part of a choice process that takes place within the realm between structure of society and practices of use (Giddens, 1984)[2]. People are embedded in a certain type of society that structures and restricts their possibilities and behaviour. This structuring occurs on a macro level (e.g. geography, economy, political system, educational system, technical advancement etc), on a meso level (e.g. organisation, social cultural community) and on a micro level (social contacts, family structure, level of education, life stage etc). In between are the ways people make sense of the structures they are a part of and give meaning to technological solutions, relating them to relevant aspects of their everyday lives and their social surroundings.

Choice making is influenced by enablers that enhance the likelihood of use, and constraints that diminish the likelihood that the new technology will be chosen to cope with challenges in the everyday life.

Expectations versus reality

When (media) technologies are technologically designed and socially constructed, specific kinds of affordances are built in that 'script' specific kinds of use.[3] However, we often see how expectations on use substantially differ from the actual practices of the users. The innovative use often only reveals itself in new social user practices (Tuomi, 2005). As demonstrated in the different chapters, these new social practices are not easy to identify. People seem to stick to what they know and project that routine behaviour scheme to other types of media and applications.

This makes the finding of Van den Broeck et al (chapter 2), that the availability of video on demand does not greatly change the viewing practices in households, less of a surprise. Urban (chapter 3) reports a similar experience with mobile television. People watch mobile TV when they want to kill time and the possibilities it offers are not widely used, which has an influence on the kinds of business models that are viable. These findings are confirmed - on a more generic level - by Vermaas and Van de Wijngaart (chapter 4). In their longitudinal study of Internet use, they show that over time the main use of Internet has not substantially changed. The daily basics are still communication and information related. Transactions, gaming, hobbies etc, are practiced less frequently and often by special clusters of users, who do not remain stable over the years. Even internet-wise people do not always use Internet as the primary choice for information. Mante-Meijer and Loos (chapter 5) show that on a crucial issue, such as choosing a health insurance company, the use of Internet as the primary or even additional source of information is highly dependent on the perceived importance of the issue in their personal lives.

Are users innovators, or are they not? Cardoso and Espanha (chapter 6) show that innovation must be understood as a dialectical process between participants of unequal power and influence in the market place and in on-going patterns of consumption and use. Many of the contributors to this book show that the decision of whether or not to

[2] See also chapter 5.

[3] Affordances are 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: 95).

make use of new technology and in what way, is only very partly a question of availability. We found new evidence for the expression 'old habits die hard'. Doing something with the possibilities offered is greatly a matter of choice and convenience. Choices are products of life styles, life stages, life experience, personal preferences and the social structures in which the individual is embedded.

This does not mean that users do not innovate or wish to innovate. When there is a fit between the possibilities offered by technology and the capabilities[4] of the individuals that are supposed to make use of them, we find them prepared to be innovative indeed, although maybe not always in the ways that the technologists expected.

Contextual aspects of technology use and innovation

Several contextual aspects have to be taken into account when talking about innovations and users.

Quality of experience

Important in the defining 'user-centric' is the concept 'quality of experience' (QoE). Some authors refer to a shift in value from products to experiences (Lawer, 2006) or from a service economy to an experience economy (Pine and Gilmore, 1999). The user/consumer - as a powerful stakeholder - can now easily switch from one supplier to another when not satisfied with the experience delivered. Purchase decisions are now increasingly based on the (perceived) quality of experience. But: how can good experiences be delivered? And how may end-users be closely involved in this process? De Moor and De Marez (chapter 7) developed a model that makes it easier to take into account the diverse aspects that have to be tackled when making quality of experience measurable.

The role of intermediaries

Linking activities and innovation of end users to the developers of technology and services is not an easy task. Stewart and Hyysalo (chapter 8) show that interactions between suppliers and users are crucial to successful innovation, but it is clear from their study that this does not happen automatically. Users and producers are generally unable to interact directly. Intermediaries of various sorts must exist or need to be created to bridge the gaps between the local setting of users and producers. It is important to recognise how intermediaries emerge from communities of users, and support and represent them, and understand how they can be supported themselves, and their value in the innovation process.

Involving the user

It is clear that the solution for technological innovation by users lies not in just developing more and more new technology. The challenge is to develop technology that is meaningful in the everyday lives of the European citizens, thereby taking into account that what is meaningful and useful for one individual or in one setting is not necessarily

[4] See Heres et al. (2005) for the fit between technology and capabilities. In this workgroup report from the COST 269 action a model was developed for explaining what is behind the use and non use of technology.

so in another. Also, it must be clear that 'innovation' has different shapes and meanings for different persons. This requires changing the current top-down approach to bottom-up methods of research, both in the development stage, as in the phases of testing, experimenting and evaluating applications: let people work with them and see what happens. This type of research could be conducted in different ways:

- Opportunity identification through archetypal users investigation

  Pierson et al (chapter 9) make use of archetypal users in a living lab setting for finding out promising mobile city applications as well as generating a typology of roles related to the practice of 'going into town'. A field experiment with representatives of the archetypal users shows how the mobile applications would be used in everyday life according to their life situation, and the type of activities they participate in.

- Grass roots innovation

  Another method is to make use of spontaneous technological innovations of activist groups of individuals that organise themselves around the appropriation of a certain technology, which is deemed useful for the group. Interestingly, this type of grass roots adoption of technology was found to give way to changes in group-culture, differential roles and power structure within the group. Proulx (chapter 10) links techno-activist practices with a theoretical model for the social appropriation of digital technology. Verhaegh (chapter 11) shows that in order to perpetuate the wi-fi broadband network non-technical people must also be able to play a meaningful role for the whole.

- 'Produsage' innovation

  The different roles users assume in spontaneous technological innovation are illustrated by Picone (chapter 12). His study of on-line news services by users shows that not everyone wants to be a producer. He identifies different levels of 'produsing' by differentiating activities of on-line users, going from lean back (consumer, listener, viewer) to lean forward (producing news, commenting, expertise).

Unexpected consequences

The chapters mentioned show that the goals of technology development are not always achieved as expected. Even involving users in the creation of technological services does not always work out in the way this was intended. De Saint Laurent-Kogan (chapter 13) shows that the organisation around a remote assistance device for elderly produced unexpected uses and unexpected tasks for the organisations that were supposed to react to the demand for assistance. These unexpected uses may result in new services that were not planned at the time of the conception of the device.

Enablers and constraints as catalysts of technological innovation

The everyday life perspective and the theory of structuration (Giddens, 1984), that links social structure with the preparedness to adopt new ways of living by sense-making, stress the role of enablers and constraints as catalysts of the innovation process. In general it can be concluded that the availability of technology is in itself only partly an enabler for use. Technology has to fit into the everyday life of the user; it has to be meaningful and give a proper solution to challenges perceived by the user, with his or her particular social cultural background, life stage and educational background.
Several authors give examples of enablers and constraints that stimulated or hampered the use of the new technology. Mante-Meijer and Loos (chapter 5) stress two things: (1) the importance of the relevance of technology to the issue that could be tackled with the new technology and (2) the accessibility of the technology itself fitting to the capabilities of the user, both technically, but also more important psychologically. Unclear websites, redundant information, inability to find the information with the means given are all crucial to the unwillingness to use even specially dedicated websites and are constraints for the use of the technology. A good user directed design providing user relevant information in a simple and clear way would function as an enabler.

Stewart and Hyysalo (chapter 8) show how social intermediaries are enablers to provide a link between producers of new technologies and their services at one side and the supposed end-users at the other side. Intermediaries of various sorts are necessary to bridge the gaps between the local setting of users and producers. Intermediaries help to lessen the constraints or act as enablers to make the use of the technology feasible and possible.

Laouris et al. (chapter 14) point to several variables that are crucial for the adoption of new technology. A brainstorm session on constraints for adoption of ICTs with the COST 298 expert community yielded four root causes that constrain the wider public from benefiting from and participating in the broadband society. Three of them have to do with the primary role of technologists in the design of ICTs, the fourth points to a lack of insight of government in the type of services the public really wants. A second series of factors relates to less adequate functioning of government and designers. A third series of factors points to the user's fear of the technology. To tackle these constraints, two directions need to be followed. First, it is necessary to approach and work more with the designers and developers of new technologies in order to encourage them to pay more attention to the user perspective. The second direction involves public bodies, media and decision makers, to promote more enthusiastically its importance and benefits.

The framework constructed by Trkman et al (chapter 15) stresses several types of enablers to encourage the use of broadband technology both in the supply side as well as in the demand side of economic policies and social activities, that come close to the general conclusions of Laouris et al. (chapter 14).

Epilogue: The future of broadband society

The presented cases give a general overview of attitudes and the behaviour of users in situations where they are invited to participate in the broadband society, and a number of the factors that influence successful user participation and user co-production. What can we expect of 'The Golden Age of Information Society' in the future? Can we expect

the unexpected? Slot and Frissen (chapter 16) argue that in the Web 2.0 era, it is no longer valid to think of users as 'end-users', as they have moved to the heart of the value network. They explore these innovative roles of users and reflect on the future impacts of this shift. As they indicate that we are still at the beginning of - what Perez (2002) describes as - a potential golden age of the information society, it is at this point in time far from sure whether we are indeed approaching a 'golden age' of technological development. In the final part of their chapter, they highlight some future aspects from the perspective of changing user-producer relations.

Concluding remarks: general advices for policy makers

The goal of the work of the 'Users as Innovators' strand in the COST 298 research network was to find out about what drives everyday users to innovate and what should be taken into account when we are thinking about broadband society in Europe, based on socio-technological research within the interdisciplinary field of Computer and Communication Sciences and Technologies (CCST). We end with some general advices on this matter for policy makers.

- Policy makers and technologists should be more aware of the role of the social structure and choice making in order to get more realistic expectations and to create technology that is more adapted to the diverse types of possible users of the society they are a part of.

- In order to bridge the gaps between the local setting of users and producers, intermediaries of various sorts must exist or been created. It is important to recognise how intermediaries emerge from communities of users, and support and represent them, and understand how they can be supported themselves, and their value in the innovation process.

- The solution for technological innovation by users is not just developing more and more new technology.

- In general, the conclusion may be drawn that the availability of technology in itself is only partly an enabler for use. Technology must fit into the everyday life of the user; it has to be meaningful and must give proper solutions to problems perceived by the user.

- 'Innovation' has different shapes and meanings for different persons and communities. The challenge is to develop technology that is meaningful in the everyday lives of the European citizens, taking also into account that there are large differences between the regions of Europe in availability of ICTs, knowledge and socio-economic settings. As users widely differ in social cultural background, in life stage and educational background, it means that what is an appropriate solution for one person might not be one for the other.

- Involving users in the development of technology is not simply asking some experienced users to try out the technology just before it gets to the market.

Everyday life experiences should be the starting point. This may be done in different ways: for example, by making use of archetypal users to simulate the everyday context in which technology may be used, or by action research and grass roots experiments, where a volunteer community is asked to use a technology and give feedback about the ways they use it or do not use it. Both ideally take place in living lab settings and in field experiments.

- Enablers and constraints will be found in the social cultural embedding of the various types of users on one hand and in the ways technology is developed and encouraged by the government bodies on the other hand. This result points to two policy directions. One, in the direction of the designers, developers and promoters of new technologies in order to encourage them to pay more attention to user practices. The second direction involves public bodies, media and decision makers to promote more enthusiastically the importance and benefits of these new technologies that are 'tailor-made' for specific kinds of users.

- The future of broadband society is still unclear. Given the different cultures and the different economic and social development in Europe, it is likely that the use of the different possibilities of broadband society for the coming years will be different for each region in Europe. It is important to stay close to the everyday life needs and possibilities of the European citizen within those regions.

- As technology will always develop at a quicker pace than society, it is very probable that the lagging behind of adoption and use *will not pass* when the older generation has passed away.

This book gives evidence-based guidelines to involve users in an effective and efficient way in the design of new media technologies. However, this also requires appropriate platforms and frameworks – possibly being set up by public authorities – where all stakeholders can enter in an open dialogue with engineers, designers and users. Hopefully the book will create an additional awareness and understanding among technology developers of 'people-centred design'. This also refers to Green (2007), who identified a shift in the way companies operate in the future: from technology led in the 1950-1970's, to market led in the 1980-2000's, to socially led from 2005 onwards. This means taking into account the social complexity and ecology of the user when (re)designing technological innovations. Only thus can the European society and economy maintain a high standard and become sustainable in the long term.

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