

Study on the Social Impact of ICT (CPP N° 55A – SMART N° 2007/0068)

Topic Report 3 (D7.2)

Final Version

**Conceptual Framework
Vertical domain reports
Horizontal domain report
Report on Findings from Flash EB**

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Topic Report 3 (D7.2)

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Conceptual Framework

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0 Executive Summary

Recent years have witnessed a growing awareness of the extent to which ICT permeates all our society and economy, and of the wide-reaching implications this has on the structures and dynamics of the European society. But in contrast to the wild speculation which was typical of the late 1990s environment before the bust of the so-called 'Internet bubble', researchers have since the turn of the decade made much progress in establishing solid evidence of the often highly complex ways in which the take-up and use of ICT has initiated, enabled or fostered process of social change. While many leading thinkers painted either utopian or dystopian scenarios in the 1980s and 1990s, what is developing now is a well-founded understanding of the real social impacts of ICT in Europe.

This research has shown that deterministic accounts of the effects which 'follow logically' from the features of certain ICTs are ill-informed. There are considerable differences not only in the extent, but also in the ways in which ICT is utilised in the Member States of Europe, and the impacts derived from them. There are, arguably even bigger, differences in the social impact of ICT between Europe and other parts of the world in which up-take of ICT is widespread, such as North America, Japan and the fast developing countries of South-East Asia.

It is against this background that the present study was set up. Twenty five years of experience affords to strike a better informed balance, both empirically and theoretically than the utopian and dystopian speculations of the 1980s and 1990s.

This study has tried to escape a number of frequently observed pitfalls in the estimation of the social impact of ICT. These pitfalls haunt many popular and policy conceptions of the opportunities and risks of new technologies. Examples are the notion of a *technological fix*, the idea that ICT straightforwardly fixes a large number of existing problems in society and the notion of a *total revolution*, the assumption that new technologies will completely change or overturn basic structures of society such as the meanwhile silently deceased conception of a 'new economy'.

This study departs from basic societal trends and not from the technological characteristics of the technology under consideration such as connectivity and convergence. We first describe and analyze what has happened in the past 25 years in the societal domains that are investigated in this project and subsequently try to answer the question which impact ICT has had on these events. What would have happened without the advent of this technology? This thought experiment affords an unconditional and unbiased estimation of the effects of ICT. The conclusion we reach then, after empirical observation, is that the transformative potential of ICT is more of an evolutionary than a revolutionary nature. Therefore, the study calls ICT a *trend amplifier*.

Ten trends reinforced by ICT are described:

1. Time: the acceleration of all societal processes
2. Space: increasing mobility
3. Scale: globalization
4. Social infrastructure: network individualization
5. Complexity: the rise of registration for control
6. Capitalism: rejuvenation and growing instability
7. Class: growing social inequality
8. Politics: civil emancipation and the rise of populism

9. Culture: the rise of participation in the media
10. Daily life: increasing choice opportunities

The following general conclusions are drawn:

The social impact of ICT has no revolutionary but an evolutionary nature. From a technical point of view ICT may be revolutionary, but her societal impact is not of that nature. This does not rule out that ICT contributes to important societal transformations. With ten contemporary trends it was observed that they are reinforced by ICT. Without ICT they would also have occurred, though to a lesser extent. This would have led to major problems in a number of societal domains such as a congestion of social and economic exchange and all kinds of organizational processes. These problems are identified in the domain reports that come after this conceptual framework.

The domain reports identify four common themes that go deeper into the social impacts of ICT than the general trends listed above. On these themes all domain reports answer a number of questions.

The four common themes and questions concerned are:

(1) Rationalization (effectiveness, efficiency, innovation)

This goes for the organizational aspect in all domains. It does not only concern production systems and the economy, but also consumption patterns and everyday life. For instance, partly on account of ICTs everyday life has been found to become more business-like as well. Think about the effects of electronic calendars and explicit choice or preference lists in profile sites and online dating.

Rationalization as a theme enables to look for the objectives in a particular domain, already present before ICT arrived but subsequently more or less supported by this technology. Further, it forces us to look at the costs the use of ICT requires as a means. Are the costs of this means worthy of the achievements?

Finally, ICT is some kind of innovation. What is the innovative capacity of ICT as compared to old activities and techniques?

- What are the traditional goals in term of effectiveness in the domain under consideration? Has the introduction of ICT brought these goals closer?
- What ICT expenditure has been made? Did it bring the expected returns yet in terms of efficiency, or are the main results still to come?
- Have the ICT applications only brought forward technological innovation or also social and organizational innovation?
- When the domain is non-economic in its nature, has the introduction of ICT reinforced businesslike approaches of calculation, registration, economic measurement and management control?

(2) Networking & Social capital

In all domains the (social) infrastructure of activities is changing on account of the networked character of present-day ICTs. It is argued that most transformative change of ICTs will be in the relations and the resources we derive from them in the information and network society. Many expect that networking will affect the distribution of social capital and the strength of social cohesion in society.

- To what extent is the domain under consideration already networked? Or does it still largely consist of separate entities that are either not online or that still work offline most of the time?
- Has networking changed the organizational structures? Has it lead to new roles, functions, jobs or organizational positions of people working?
- Can particular network externalities be observed? For example: has a critical mass of online connectivity already been reached? Is there a call for common standards or protocols for the networks?
- Can a particular growth of social capital be observed in the particular domain? 2. Does social networking contribute to improvements or degradations according to accepted norms or values?
- What type of social capital presently dominates the domain: bonding capital (strong ties of similar people), bridging capital (weak ties of similar but distant people) or linking capital (weak ties of unlike, mostly distant people)?
- What is the role and what are the achievements of so-called social or participatory media?
- Does ICT lead to more or less social cohesion in relevant communities of the domain (e.g. health, education, leisure and resident communities)?

(3) Empowerment and participation

The common scientific and public opinion expectation is that ICT will change power relations in many, if not all domains in society. Some think that centralization will occur, but most think decentralization will happen. The most popular expectation is that ICT is empowering users of all kinds: citizens, consumers, workers, patients, students and audiences. Here the main questions are:

Do/will ICTs substantially change the relations between governments and citizens, producers and consumers, doctors and patients, teachers and students etc? Increases in participation and empowerment could be understood as key elements of beneficial, transformative change, but ICTs can potentially also be used to curtail participation and individual freedoms.

- What has been expected of a change of relationship between the most important actors in the domain and what has actually occurred? Have those in power yet reached more power in their control of design, investment and implementation of ICT or can a bottom-up trend be observed? Is the popular expectation true that users and user-generated content increasingly define what happens?
- Has the *nature of the relationship* between governments and citizens, producers and consumers, managers and workers/employees, doctors and patients or teachers and students changed on account of ICT?
- Has ICT increased participation of citizens, consumers, workers, patients and students in goal settings and in the ways goals are being pursued?
- What is the level of access to ICT (primarily computers and the Internet) in the domain under consideration? This question goes for at least three types of access: 1. physical access to computers, the Internet and other digital media; 2. digital skills and 3. use: the quantity and quality/ kind of applications.

(4) Information and Lifelong learning

The meaning of the concept information society is that in all human activities and in all domains information intensity is increased. This implies that a growing part of all activities, in work and leisure time, and obviously in education consists of searching, collecting,

processing, evaluating and applying information. Obviously, ICT strongly supports the opportunities of lifelong learning, both on the job, in formal education and in leisure time.

- To what extent have information jobs and information activities grown in the domain under consideration? What are the typical ways of information processing and exchange before and after the introduction of ICT?
- What is the relationship between professional and lay information processing or learning? For example, how do teachers and students, doctors and patients, civil servants and citizens, managers and employees learn and exchange the results of learning. Do applications of ICT support these ways of learning?
- What are the opportunities of learning with the aid of ICT? What is the role of peer-to-peer networking at all levels? What are the opportunities of computer interfaces in interactive learning for students, workers, consumers, citizens, patients etc.?
- Does ICT only support so-called 'new learning' by individual and network interaction and association or also more traditional modes of knowledge transfer (classroom and unidirectional learning)?

1 Introduction

Recent years have witnessed a growing awareness of the extent to which ICT permeates all our society and economy, and of the wide-reaching implications this has on the structures and dynamics of the European society. But in contrast to the wild speculation which was typical of the late 1990s environment before the bust of the so-called 'Internet bubble', researchers have since the turn of the decade made much progress in establishing solid evidence of the often highly complex ways in which the take-up and use of ICT has initiated, enabled or fostered process of social change. While many leading thinkers painted either utopian or dystopian scenarios in the 1980s and 1990s, what is developing now is a well-founded understanding of the real social impacts of ICT in Europe.

This research has shown that deterministic accounts of the effects which 'follow logically' from the features of certain ICTs are ill-informed. There are considerable differences not only in the extent, but also in the ways in which ICT is utilised in the Member States of Europe, and the impacts derived from them. There are, arguably even bigger, differences in the social impact of ICT between Europe and other parts of the world in which up-take of ICT is widespread, such as North America, Japan and the fast developing countries of South-East Asia. What this means is that social practice, which includes policy-making, can have a real effect on the benefits which members of society derive from ICT, and on the extent to which potential disadvantages exert a negative influence.

While considerable theoretical insight and empirical evidence have been collected on the individual factors which underpin 'quality of life', 'empowerment' or 'freedom', a widely accepted assessment of the impact of ICT on individuals in their societal context is not yet available.

It is against this background that the present study was set up. This conceptual framework will provide the basic approach, concepts and questions used to estimate the social impact of ICT in contemporary European societies. The time span that is chosen for this estimation is 25 years. In the year 1983 the first PC with a 'simple' operating system for a mass audience was offered by IBM. This has launched the whole technological development that has led to the breakthrough of the Internet in the shape of the World Wide Web ten years later. Twenty five years of experience affords to strike a better informed balance, both empirically and theoretically than the utopian and dystopian speculations of the 1980s and 1990s.

The following section will give a short overview of the most important general conceptions of the impact of technology on society. It is impossible to escape questions about causality between technology and society in general when our task is to estimate the social *impact* of ICT. These conceptions will be put on a scale between technological determinism on the one side and social constructivism and voluntarism on the other. Often these ideas will be linked to dystopian views and utopian views respectively. A third conceptual distinction will be related to the nature and speed of change discussed here: has the social impact of ICT an incremental, evolutionary or revolutionary nature?

In the third section a number of frequently observed pitfalls in the estimation of the social impact of ICT will be discussed. These pitfalls haunt many popular and policy conceptions of the opportunities and risks of new technologies. Examples are the notion of a *technological fix*, the idea that ICT straightforwardly fixes a large number of existing problems in society and the notion of a *total revolution*, the assumption that new technologies will completely change or overturn basic structures of society such as the meanwhile silently deceased conception of a 'new economy'.

The fourth section is the largest one. Here the conceptual approach of this framework is revealed in the description of ten basic trends in contemporary developed societies that are reinforced by ICT. This section shows the basic approach of this EU project. The estimation

of the social impact of ICT *departs from basic societal trends and not from the technological characteristics of the technology under consideration* such as connectivity and convergence¹. We first describe and analyze what has happened in the past 25 years in the societal domains that are investigated in this project and subsequently try to answer the question which impact ICT has had on these events. What would have happened without the advent of this technology? This thought experiment affords an unconditional and unbiased estimation of the effects of ICT. The conclusion we reach then, after empirical observation, is that the transformative potential of ICT is more of an evolutionary than a revolutionary nature. Therefore, the section title calls ICT a trend amplifier.

In this concise conceptual framework the ten trends presented can only be described in a general way and provided with references. Empirical specifications of some of these trends will be supplied in the domain reports and the statistical report. However, these trends are so broad that we will not attempt to fully cover them in the domain reports. The function here is to propose a particular approach to the social impact research question.

The following function of this conceptual framework is to provide a number of common themes and questions for the domain reports. We have to prevent the risk that they will produce overviews of particular domains that are fragmentary and have no relationship to each other. Therefore section five will describe common themes running through all domain reports together with a number of questions all reports will try to answer when appropriate.

2 General Conceptions of the Impact of Technology on Society

The question of the current social impact of ICT is a special case of the general influence of technology on society. Other case examples are the impact of biotechnology and nanotechnology or the impact of older media such as the press and broadcasting.. In the philosophy and history of technology the conceptions of the influence of technology on society range from full technological determinism to pure voluntarism. The first extreme holds that technology has a decisive influence on society; the second extreme maintains that technology affords many, if not any choices societies can make by the use of technology. We will shortly pass this scale from determinism to voluntarism in describing a number of popular conceptions of the impact of ICT on society.

Technological determinism claims that society is shaped by technology in general and techniques in particular. The technology is *defining* because it has a number of intrinsic characteristics that define what people are able to do with this technology. The effects of these characteristics - the techniques in the technology - on the behaviour and conceptions of people are fixed. Often one uses concepts with the adjective technological, such as technological culture and technological environment. Jacques Ellul has written the most technological-determinist analysis that has appeared so far: *The Technological Society* (1964)². This is a deeply pessimist portrayal of man and society that are completely subjected to modern technology without any potential to escape. In 1977 Langdon Winner published a book with the telling title *AutonomousTechnology*³. According to him techniques

¹ This is the basic difference with the approach taken by RAND in their study *Policy Options for a ubiquitous Internet Society* (SMART 2007/0031). This study departs from a technology assessment, in this case of connectivity, convergence and other Internet trends, and tries to assess the social and economic impact of these technological trends and the policy challenges they pose. This is a very common approach. However, it runs the risk of technological bias. In this study we want to explore the approach that departs from societal trends.

² Originally published as *La technique ou l'enjeu du siècle* (1954).

³ Cambridge MA: The MIT Press.

have autonomous power; they are ‘greedy’ and gradually take control of society, politics and culture. Pessimism about the impact of technology is a feature of many evaluations in the twentieth century before the rise of the internet and other supposedly liberating technologies. For example, the members of the Frankfurter Schule, in this case notably Horkheimer’s philosophy of technology, strongly testify to this attitude. Pessimism is a common attitude among technological determinist scientists and philosophers but optimism might be more popular among the people. This appears in conceptions of technology creating a complete revolution that offers progress for society. These ideas will be discussed in the next section.

The best-known analyst of the impact of ICT on society that testifies to a (moderate) technological-determinist view is Manuel Castells. Technological determinism is explicitly denied by Castells (1996, pp. 5) himself but the central theme in his magnum opus *The Information Age* is the effect of informationalism (a mode of development) on capitalism (a mode of production). He defines a mode of development as a *technical* relationship of production and a mode of production as a *social* relationship. It is a new kind of base-superstructure distinction. Some determinism also appears in Castells’ view on the network society. According to Castells the ‘logic’ of the network society is pervading all spheres of social, economic and cultural life. It is self-expanding, all-embracing, and tends to marginalize the remnants of the old society. ‘In the Information Age, the prevailing logic of dominant global networks is so pervasive and so penetrating that the only way out of their domination appears to be out of these networks and to reconstruct meaning on the basis of an entirely distinct system of values and beliefs’ (ibid., p. 351.). According to Castells this escape is attempted by particular communities and resistance movements. There is no opposition inside networks⁴. Castells once expressed his view that with networks ‘we have created a machine which is dynamic, full of opportunities but is controlled by no one’⁵

At the other side of the scale of general conceptions of the influence of technology on society we find the opposite view of technological voluntarism. Individuals, organizations and societies at large are in control of technology and they are able make it work as they wish. In this view society, culture, politics and individuals create all techniques and all aspects of technology. This affords to make many, if not all choices they like to make: the technology is *enabling*. Techniques have no fixed inherent characteristics and technology is neither good nor bad. Here the instrumentalist view of technology is most popular. This view will be discussed below. Instrumentalism also is an option with technological determinism. However, here the instrument is a powerful force that cannot be escaped and that is used by powerful interests in society to suppress others. In technological voluntarism technology most often is an instrument of liberation and it can be used for progress in all spheres of society. According to Ithiel de Sola Pool they are *Technologies of Freedom* (de Sola Pool, 1983). So, optimism is more frequently observed with voluntarism than with determinism.

A well known moderate type of technological voluntarism is the social constructivist view of technology. This view claims that individual and organizational users and regulators in society are continually constructing the design and operation of technologies (Bijker et al., 1987 and Bijker & Law, 1992). Strong and weak social constructivist claims are available (Brey, 2003, p. 31). The weak claim means that ‘technological configurations are variable and strongly conditioned by social factors’. The strong claim goes further stating that ‘technological change can be entirely analysed as the result of processes of social negotiation and interpretation, and that the properties of technologies are not objective, but are effectively read into the technologies by social groups’ (ibid.). So, social constructivism

⁴ Recently, Castells has changed his position. In *Communication Power* (2009, Oxford, New York: Oxford University Press) he argues that the ‘logic’ of power in networks can be transformed and that communication networks can be reprogrammed.

⁵ In an interview with a Dutch newspaper: Oosterbaan, W. (1997) ‘We hebben een machine gemaakt die door niemand beheerst wordt: Socioloog Manuel Castells over de netwerkeconomie’ (NRC Handelsblad, November 8, p. 33)

argues that technologies, certainly technologies with strong human characteristics such as *information and communication* technologies are socially shaped. This view certainly denies that technological change follows a fixed, linear path which can be explained by some inherent logic. Instead, this path is non-linear and can go in all directions according to the wishes of users and designers.

In this conceptual framework a dialectical conception of technology that is both *defining and enabling* is defended. It tries to escape the extremes of determinism and voluntarism and it claims that technology and society are in a continuing process of *mutually shaping* each other⁶. Regarding society this view explains the dialectic of social structures and human actions that mutually shape each other⁷. Concerning technology this view defends the dialectic of technical structures or characteristics and their design and use, also mutually shaping each other.

The importance of emphasizing the enabling dimension of technology is that it offers us continuous choices and that it leaves room for policies, among them EU policies. The relevance of searching for defining characteristics of the technology under consideration is that it shows which characteristics are exerting pressures and putting limits on these choices and policies. To emphasize that these characteristics are not purely objective and follow no inescapable inherent logic and that they are not completely (inter)subjectively framed either, the word *capacities* of technology, or capacities of ICTs, might be better than the term characteristics.

Another position taken in this conceptual framework is the conception of the nature and speed of change that is created by information and communication technologies in society. The position taken is that the impact of ICT is *evolutionary*, rather than revolutionary. ICT sooner reinforces particular societal changes that were already going on than revolutionizing society. The technological capacities of ICT such as convergence and connectivity might be revolutionary in their own right, but their impact on society might not be of that nature. A popular everyday notion is that contemporary changes in technology and society have never been so fast before. It is doubtful whether this is true. Exactly hundred years ago, at the former turn of a century, rapid changes also occurred in a short period of time. They took place in society (urbanization and industrialization) and in technology (the introduction and diffusion of photography, film, telephony, radio, television and new transport means such as cars). Who is able to show that the current 'digital revolution' offers so much more sweeping change?

This is not to underestimate the importance of contemporary change affected by technology in general and ICT in particular. - In biology evolutionary change might also be radical: whole species and kinds disappear from time to time in natural history. – Here we will take the position that changes reinforced by ICT are not incremental, but transformative for many social structures and aspects of daily life. According to William Dutton (2004, 2005), choices about the use (or non-use) of ICT "reconfigure the electronic and physical processes through which [people] access vital social and economic resources", by which he means: people, services, information, and technology. Such reconfigurations, he says, give rise to social transformation, often related to empowerment of people as citizens, workers, consumers, patients etc.

Often, "transformative" is understood as uses of ICT that open up substantially new ways for individuals, firms and governments to achieve their goals. In many cases, this refers to

⁶ An important forerunner of this view of technology is the famous historian of technology Lewis Mumford. In his *Technics and Civilization* (1934) he shows that new techniques and important scientific discoveries are mainly used to reinforce existing societal processes and relationships instead of replacing them. These techniques and discoveries are preceded and accompanied by cultural changes. Before humans started to use machines on a massive scale our worldviews and relationships were already mechanized.

⁷ An instance is the well-known structuration theory of the British sociologist Anthony Giddens.

activities which *would not have been possible without ICTs*. Conversely, we will ask ourselves repeatedly in the following domain reports *what would have happened in these domains without ICTs?* By not taking the technology (in this case ICT) and its capacities or challenges as our point of departure we hope to uncover its impact on society in an unbiased a fashion as possible.

Before we are going to describe a large number of current societal trends that are reinforced by ICT we have to reveal a number of pitfalls in the estimation of the social impact of ICT that are commonly made in policy documents and in public opinion. These pitfalls are related to general conceptions of technology that are either overly deterministic or voluntaristic.

3 Pitfalls in the Estimation of the Social Impact of ICT

Usually there are three questionable ideas or types of reasoning behind exaggerated estimations of the consequences of new technologies. They have been listed and discussed by Joseph Corn (1986) in the 1980s.

3.1 *The idea of a total revolution*

The first assumption or idea is that new technologies will radically change our lives. This is a conspicuous refrain in many thoughts about the present and the future of technology. However, it would be wise to remember that this refrain has resounded many times in history before. A first example is the invention of electricity that was estimated to lead to a radical decentralisation of society in the nineteenth century, notably just before the rise of massive bureaucracies. Another example is the advent of radio that spurred expectations that people themselves could become broadcasters and direct democracy would lie ahead. What actually happened was the rise of communism and fascism shortly afterwards. Currently, the same song is to be heard. It is argued that the participative nature of the contemporary Internet will fade away the traditional mass media and institutional politics. In education so-called independent 'new learning' is held to replace traditional classroom learning. Many other examples could be mentioned. Some of them will be given in the next section. What is actually wrong with this argument? The first mistake of this argument inspired by determinism is that technical opportunities are converted into social realities much too fast. Technological innovations rarely lead to societal revolutions straight away. This did not go for the industrial revolution and it won't happen either with the current information or communication revolution. Technological innovations only drop into fertile soil when they join with social, economic and cultural innovations, subsequently perhaps emphasized and accelerated by these technologies. The second mistake in this type of reasoning is that it often is wishful thinking. The hope that tomorrow will be better than today or yesterday is the driving force behind the idea of a total revolution.

3.2 *The idea of social continuity*

The second argument is the exact opposite of the former. This is the assumption of social continuity. Here new technologies are seen as mere continuous improvements of existing technology. The motor car was an improved coach. The Internet primarily is faster: it is an electronic highway. Potential societal effects do not bring much news. At the most new technologies can solve old problems. What is wrong with this pragmatic and sober argument? In the first place this type of reasoning underestimates the transforming potential of ICT. Not all changes brought forward with the aid of ICT are incremental. But transformation is not yet a revolution. This would require structural changes in society. Examples of such changes are the break away of the 9 to 5 working day as a norm, the replacement of the modern capitalist economy by a 'new economy' and a domination of the

mass media by so-called user generated content. In the analysis below we will argue that these revolutionary changes are *not* to be expected.

A second underestimation of this argument is that the technology in its own right certainly can be revolutionary or disruptive. The most important revolutionary characteristic of present-day digital technology is the convergence of most old infrastructures creating a all-embracing, digitally enhanced infrastructure for our (network) society. This might lead to a number of substantial social changes. Some of these changes will never be discovered following the argument of social continuity. Usually they are called second order effects of new technology: social side-effects not foreseen.

The last mistake in this argument is that it appears to have a blind spot for new effects. This is caused by the fact that new technology creates new problems, and not only helps to solve old problems.

3.3 The idea of a technological fix

A third type of doubtful reasoning is the idea that new technology can solve most if not all social problems. This is the voluntaristic idea of a technological fix. The new technology, e.g. ICT is seen as a solution for a large number of societal problems. Does one observe a gap between politics and citizens? Internet democracy is the solution. Is our car circulation stuck in traffic jams? Telework shows the exit. Is there not enough manual care in hospitals as compared to administration? Electronic patient systems free doctors and nurses for physical care. The obvious mistake in this simple reasoning is that it is much too superficial. The problems mentioned have much deeper causes. They are not to be solved by ICT as a set of instruments alone when no organizational and political measures are taken simultaneously. Moreover, in this argument a certain technology is often related to one particular effect only. Telework reduces traffic queues. Video camera's in public spaces have a 'Big Brother' impact.

3.4 Instrumentalism

We want to add a fourth pitfall. The main argument in this conceptual framework is that ICT primarily reinforces a number of existing societal trends. At first sight this seems to reveal an instrumentalist view of technology. Apparently, technology is seen as some kind of lever. In this respect some call ICT a *general purpose technology*: it can be used for any purpose, good or bad. However, we try to escape an instrumentalist view as this is much too simple and does not correspond to the argument we propose. In the instrumentalist view technology is a *means* for a particular *goal*. Several actors are able to use this means for their own goals. In this way technology is seen as a solution for existing societal, organizational and individual problems. This view easily leads to the view of ICT as a technological fix. However, the difference between the two is that the idea of a technological fix is always framed in a positive manner while instrumentalism can also be linked to negative uses and consequences. This possibility of both positive and negative effects immediately shows the first problem with this argument. Often totally different goals are reached as compared to those expected or desired. In the section below we will come across many instances of this occurrence. We will mention a few examples. One expects to save time using applications of ICT but increasingly full calendars or schedules and a speed-up of all social, economic and cultural processes are the actual result. One assumes that telework can solve traffic jams but the overall use of ICTs supports mobility instead of reducing it. One notices that the Internet gives access to more knowledge and information for everybody, but we will also show that an increase of inequality is a more probable result because the Internet and these sources of information are used so differently by people with different social backgrounds. Frequently, these unforeseen effects are so-called *second order effects*. They usually have much deeper social causes than the *first order effects* expected by people defending an instrumentalist view of technology.

A second problem with the instrumentalist view is that in fact goals and means are not independent, but they influence each other. This is the well-known interaction of technology and social context. This means that the instrument is continually reshaped through goals that are aimed for in practice. As soon as particular users of mobile phones, particularly young ones, started to use the marginal design feature of SMS, to the utter surprise of the telephone manufacturers, these producers immediately adapted their means (supply) to this goal (demand).

A related problem is that a means is able to corrupt a particular goal. It can cause new problems. Sometimes the means, the cure is worse than the problem to be solved, the disease. Examples are the many failures of automation in organizations that tried to improve their effectiveness and efficiency with the aid of ICT. A very high percentage of automation projects in companies and government departments is known to fail or at least delayed. In these cases goals are not only not attained but in practice often also changed during the project to prevent explicit failure and image damage. The interesting conclusion of many evaluations of these projects is that many times a very narrow instrumentalist view of ICT was adopted and important social and cultural characteristics of the organization concerned ignored.

A final problem with the instrumentalist view is that ICT as a collection of means reveals a clear affinity with particular goals. So, ICT cannot be easily separated from these favourite goals. And it cannot be used for opposite goals. In this regard ICT is not a general purpose technology. In particular respects technology can be defining. This goes for instance for the registration and control potential of ICT. This cannot be cut out of this technology. Particular social effects of this potential, such as likely privacy loss can be combated but the registration and control potential remains. In these defining aspects of technology probably hide the most important social effects of ICT in the long term. Unfortunately, the instrumentalist view tends to emphasize the enabling aspects of technology that are much easier to find.

4 ICT as a Trend Amplifier: The Reinforcement of Ten Major Trends in Contemporary Society

In this long section we will describe ten major trends in contemporary European societies that might be influenced by and are often even believed to have been caused by the arrival of ICT. The selection of these trends was made with the following considerations:

- They should be social, not technological trends
- They should be sufficiently broad to encompass social, economical, political and cultural aspects; basic coordinates of society such as time, space, scale and social structure should be contained
- They should be sufficiently broad to be influenced by other factors than technological factors only;
- They should be longitudinal or epochal trends that may have already started several decades ago in order to be able to observe the influence of the arrival of ICTs
- They should be related to ICT in many scientific analysis and policy documents; this is not to conflate ICT and its social impact but to rule out the possibility that important social trends are ignored that might be influenced, if not caused by ICT.

Nevertheless, others may observe other major social trends influenced by ICT that we have not selected. The pretention of completeness would be too high for this relatively short framework.

4.1 Time: the acceleration of all societal processes

Let us begin with the most basic dimensions, those of space and time. The core of the opportunities of ICT according to many analyses and documents is that the technology works 24 hours a day and seven days in a week, and that this goes world-wide. The popular view is that ICT annihilates the significance of space and time and that this is a new phenomenon. Promoting this view Cairncross declared ‘the death of distance’ (Cairncross, 2001). Some scientists such as Castells support this view with expressions such as ‘the annihilation of time’, ‘timeless time’ and a ‘space of flows that replaces a space of places’ (Castells, 1996)

In fact the importance of the dimensions of time and space grows in the contemporary network society (van Dijk, 1999/2006). Their significance radicalizes because they are used ever more selectively. The new media support this. However, this trend is not new. The acceleration of social life already appears from the start of Western modernization in the sixteenth century. After the industrial revolution it was set into a following gear. Without the intervention of ICT acceleration would have stepped-up again in the twentieth century, if only by the steep rise of transport means.

Giddens (1990) has described human history as an extension of the dimensions of space and time. Traditional societies rest on direct interaction between people living close together. Modern societies expand more and more in both space and time. Time barriers are crossed by a turn over of tradition in all kinds of sources. Spatial barriers are crossed with transport and communication means. ICT has only continued this historical trend. Until the trend reaches a particular tipping point and bounces back. Then time and space actually start to shrink within expanding limits. For this phenomenon Harvey uses the term *time-space compression*.

The term compression best expresses what happens: a radicalization of the significance of these dimensions. The time and place options are treated ever more critically. The new media enable this treatment. Despite or by means of the existence of ICT the location of a company or institution becomes ever more important. With applications such as Google Maps and the mobile phone we can make appointments on the exact spot of a meter. Our very precise electronic calendars stimulate to fill the last holes in a daily schedule. The plain fact that one is able to check ones email at home, or everywhere else gives us the opportunity to complete a task for Monday morning already on the Sunday night before.

Does this mean that the radicalization of the significance of time also has a decisive influence on our daily spending of time? This is not the case. The technological opportunity of time compression collides with the physical and social reality of human beings. These poor creatures are not able to meet the speed of systems of ICT for seven days a week, let alone 24 hours a day. Biological and social rhythms are standing in the way. The best proof of this statement is that 25 years of PC and Internet experience and the real opportunities of telework, telestudy and the like have not managed to break the nine to five daily rhythm. This stands solid as a rock (EWCS, 2005) for both full-time and part-time employees, though small fringes of the nine to five time-span are cut back by those trying to escape traffic jams going to work and returning home (Harms, 2008).

Future expectations are that these fringes will be stretched more with the aid of ICT, but not that the basic synchronization of humans living together or fixed rhythms for the day or the week will be broken. That would be a true revolution.

4.2 Space: increasing mobility

A comparable popular idea is that place is no longer significant with applications of ICT. After all one is able to get access about everywhere to the global network. Initially, this was linked to the assumption that getting access would happen primarily from the home. In 1980 Alvin Toffler in his Third Wave still proclaimed the electronic cottage as a serious future perspective. In the mean time this appears to be a mistake of the same order as the

paperless office projected in the same 1980s. Nothing has come true of this perspective, despite all marginal attempts to realize telework at home⁸. Actually the opposite has happened: a sharp rise of overall mobility in society (Breedveld et al., 2006, p. 31) and a strong support of this trend by ICT (Harms, 2008, p. 86; cf. Sciadas, 2006).

Increasing mobility is a deeply rooted trend in modern society. By itself it has no relationship at all with ICT. Instead it has many social causes (Mokhtarian et al., 2004). On the field of demographics we are able to observe the shrinking household and the rise of the number of people living alone that drive people outdoors for social life and assistance. In the economy the geographical scale of labour processes is expanding and labour participation of women and housewives is rising. The growth of income and car ownership enable unimpeded travelling for work, study and leisure time. In a cultural respect spending leisure time outdoors is intensified and varied. ICT strongly supports all these trends. Below it will be argued that the new media enable an individualized existence and lifestyle. Simultaneously, these media maintain the possibility to keep in touch with employers and colleagues at work being on the road or working at home. These days appointments for our overfull calendars of leisure spending can only be realized with the aid of cars and modern communication means such as mobile phones, PDA's and e-mail.

As argued above the selectivity of space and places also increases. This goes for location of companies, the choice of places to live and of appointments for meetings and joint activities. Better logistics is not only a secret of efficient modern business management, but also for the coordination of modern life. ICT is becoming an essential means for this purpose. However, the successful use of ICT for everyday logistics largely depends on the extent to which online communication can be a replacement of offline communication or a supplement of this. Or can both be successfully integrated in the coordination and realization of our daily activities?

Considering the relationship between online and offline communication we have witnessed three periods with different perspectives in the past 25 years. In the 1980s and the start of the 1990s online communication or CMC ('computer-mediated communication') was seen as a potential replacement for offline or face-to-face communication. The image of the electronic cottage as a replacement of outdoor living and working fits into this perspective. Frequently online communication or CMC was immediately characterized as a second-rate substitute for familiar offline activities that regarding quality is no match for face-to-face communication.

After the breakthrough of the Internet and the World Wide Web in the second half of the 1990s the value of online communication was rated higher. For many activities this would be a serious supplement of offline communication with its own additional qualities such as independence from time, space and physical conditions. All kinds of e-activities, from eCommerce to eGovernment started to be viewed as required supplements for comparable traditional activities.

After the sudden end of the Internet hype in 2000 and with the rise of mobile equipment of ICT the perspective of the integration of online and offline communication appeared. As a supplement both types of communication are used in parallel. With integration both types of communication merge. Lightweight mobile equipment allows to be both or simultaneously active in online and offline environments. Undoubtedly, this is the perspective of the future. It enables us to attach an ever more selective importance to particular times and places. We can choose the best times and places for high-quality communication while keeping in touch with messages and events with a lower value for us.

The argument above implies that the trend of increasing mobility will only be reinforced more by ICT in the future. Until this trend also reaches its limits. Mobility will collide with the

⁸ The maximum current number of teleworkers (broad definition) in the EU ranges between 5 and 10 percent.

physical limitations of humans to be on the road all of the time, the material restrictions of rising transport costs and the limits of ecological non-sustainability.

4.3 Scale: globalization

That ICT supports globalization, is a statement almost everybody takes for granted, whether one believes in McLuhan's *global village* or not. Yet, a number of comments have to be added to this statement. Globalization is no new phenomenon either. It has occurred in many waves since the Western colonization of the world (Bayly, 2004). Each time progress in information and communication technologies offers a strong support. At the former turn of the century a worldwide industrial capitalism caused a new wave of globalization. This was supported by the technology of the first communication revolution of modern times (van Dijk, 1991/2006) that gave us telephony, photography, film, radio, television and an (inter)national press among others. The second communication revolution currently happening, marked by digital media, is indispensable for the acceleration and deepening of contemporary globalization characterized by the diffusion of borders in a worldwide production, circulation and consumer processes and by a liberalization of the world market. In the cultural sphere international satellite television and telephony have unified the world before. The Internet, e-mail and wireless mobile communication have added a significant further step, particularly in the experience of people.

An important difference between the former and the current wave of globalization can be observed. While the former was dominated by scale extension, among others supported by powerful new mass media, the present wave is a combination of scale extension and scale reduction. The last trend is a reduction that among others appears in the growing attention to local activities or identities and in the basic process of individualization. Sometimes the term 'glocalization' is used for this combination of scale extension and reduction. Networks, among them networks of ICT have both a centralizing and a decentralizing effect, though many will emphasize the horizontal dimension of networks. In the course of the twentieth century information and communication networks have primarily supported a spread of transnational companies across the world. From the 1930s onwards they enabled a simultaneous process of downsizing and a division of production activities followed by expanding subcontracting with a central management still being able to keep an eye on the divided process by means of ICT. In this way the processes of centralization of capital and control of production have been combined with a decentralization of production itself (van Dijk, 1991/2006). ICT and forms of network organizations have realized this combination and created a sweeping flexibility of economic processes.

4.4 Social infrastructure: network individualization

This global infrastructure of scale extension and reduction combined is also reflected in the social infrastructure of contemporary Western societies. According to many sociologists individualization is the most important trend of these societies. This means that increasingly the individual is the basic unit of society instead of groups or collectivities. This process appears in quite a number of trends such as the reduction of average household size, a bigger part of the day that people are spending alone or in the company of media, the differentiation of needs and activities and greater personal independence from the immediate physical and collective environment. ICT is one of the technologies enabling this way of living, together with transport, energy and household technologies. All these technologies have supported this way and style of living.

Sociologist Berry Wellman (2000) has invented the concept 'network individualism' for this trend, while van Dijk prefers the term 'network individualization' (van Dijk, 1999/2006). The increasing significance of social and media networks for our network society is the necessary counterpart of individualization. After all, the social, collective and societal aspects of our existence are not less important than before; they are only organized in a different way. Henceforward, the individual is the starting point, at least in Western societies.

From 1975 onwards the number of direct, physical social contacts, both in households and outdoors has been steadily reduced (Breedveld et al., 2006). This is a clear sign of individualization. However, from the 1970s onwards this decline of physical contacts is compensated by fast increasing telephone use. In the last fifteen years this has been stepped-up by mobile telephony, e-mail and instant messaging or chatting (Huysmans et al., 2004). So-called strong ties have partly been replaced by weak ties on a longer distance. In recent years we have witnessed the phenomenal rise social networking sites such as Facebook, Friendster, Hyves, LinkedIn and MySpace. In EU countries it is estimated that between 20 and 50 percent of Internet users have a profile on these sites (OECD, 2008; see also Fisch & Gscheidle, 2008). Another fast growing phenomenon is online dating that is estimated to be used by 20 to 25 percent of Internet users searching for a partner. These are all appearances of network individualization on a personal scale. The new media support this trend with ever more facilities that strongly stimulate our abilities of creativity in communication.

The classical sociological discussion on the question whether the Internet in general reinforces or reduces the sociability and the social cohesion in society, recently is ever more settled to the advantage of those who observe a reinforcement (see a.o. Katz & Rice, 2002 and Wellman & Haythornthwaite, 2002). According to Katz and Rice the Internet increases social capital in terms of social , citizen engagement and community. Only, the problem is that some sections of the population benefit much more than others from these opportunities (see below).

The Internet does not only offer unprecedented facilities for social contacting but also for community building. Existing communities are not only going online more and more ('communities online'). The Net also creates virtual communities that often are communities of interest ('online communities'). Does this mean that both types of communities are recovering the so-called 'lost communities' of traditional mass societies and that they will compensate the lost direct social contacts in online environments? Most likely this example of a technological fix will not occur. Traditional forms of sociability will not return. They will be replaced by new forms that might be new in their electronic or digital shapes but in fact will only extend a number of trends that are a hundred years old and that do not depend on ICT at all. These are trends such as the extension of social and personal networks across much larger distances than before, the support of our social relationships by telecommunication media and the blurring dividing lines between public and private communication (van Dijk, 1999/2006). The trend of greater personal discretion in choosing contacts according to ones liking instead of being determined by birth or location also is an older modernization trend.

4.5 Complexity: the rise of registration for control

That ICT offers the most important means to satisfy the growing need or drive for registration and control in all parts of contemporary society is easy to understand. The question what is the origin of this need is more difficult to answer. That requires a typification of our society. For this purpose a large number of classifications are offered that all are related to registration and control. The classifications information society and network society have a very general nature. The first indicates that all activities in our society have a growing information intensity. This implies the registration of these activities. The second classification points out that increasingly the organization and structure of society are carried by integrated social and media networks. Networks happen to be vulnerable social and technical (infra)structures that require control and need particular norms, codes, standards or protocols to operate (Lessig, 1999). What would be the Internet without the TCP/IP protocol? To communicate in decentralized environments and in peer-to-peer networks would be impossible. So, in certain respects a technology can be defining.

The use of the general terms information and network society does not rule out more traditional classifications. Clearly, European societies are capitalist in an economic view, constitutional democracies in a political sense, post- or late modernist in a cultural fashion

and non-sustainable in an ecological respect. It would be possible to show the relationship between all these classifications and the needs for registration and control. That would go much too far here. After all, two other labels seem to be better suited to the trend discussed here.

Ulrich Beck (1992) has called contemporary society a risk society. This is a type of society that continually prepares itself on risks that are created by humans themselves, not so much the risks of nature. These self-made risks originate from her exceptionally complex present-day technology and organization. These risks can only be kept under control by permanent control by, among others, registration and signal systems. According to David Lyon (1994) this leads to a surveillance society. This term indicates a society in which the individual is observed by a focussed, systematic and permanent registration of personal data in order to reach more influence, to be able to lead, to manage and govern and to protect (Lyon, 2007).

Van Dijk (1999/2006) has tried to specify these general classifications linking them to the rise of ICT. He has done so via an extension of the historical analysis of James Beniger in his book *The Control Revolution* (Beniger, 1986). In this book Beniger describes a number of societal innovations in the second half of the nineteenth and the first half of the twentieth century as solutions for a crisis of control in production, distribution and consumption, a crisis that appeared in the aftermath of the Industrial revolution. These solutions were the innovations of the bureaucracy, new ways of transport and communication and the rise of mass communication and mass consumption. According to van Dijk these solutions became impediments for the organization of society in the twentieth century. For instance, it got caught up in bureaucracy. Gradually they have been replaced by new solutions, a large part of them carried by ICT. Now bureaucracy is replaced by '*infocracy*': organizational control supported by ICT. Old connections of transport and communication are supplemented and partly replaced by ICT networks. Finally, mass communication and mass consumption are partly replaced by narrowcasting and personalization in the media and in marketing. These processes are clearly backed by the Internet and other digital media. The three series of solutions or innovations completely depend on the registration and control potential of ICT.

So, in this respect ICT again is an amplifier of trends that are much older than 25 years. They are a consequence of the epochal trend so thoroughly analysed by Max Weber: the rationalization of politics, economy, culture and worldviews that started at least 50 to 100 years before the coming of ICT. In turn, rationalization is a response to the increasing complexity of modern society (Urry, 2003). Contemporary ICT only reinforces the registration drive and potential of present-day society, linking a longer existing database technology (already available before the computer came) with that of computer networks. Subsequently, these networks have become mobile and ubiquitous. They are currently penetrating in all pores of society and human lives, as no longer only humans are connected but also things with chips built inside. In the mean time individuals can be traced 24 hours a day, and in most of their activities and spheres of life. The loss of privacy linked to this trend is deplored by many. Nevertheless it continues unrelentingly.

Even so, the harm of privacy is no inescapable future prospect. The classifications of society defined above make a determinist impression. In fact, these characteristics of society are created by people that have other needs than efficient organization and safety only. For example, the needs of freedom and protection of personal life. In response to the privacy threats of ICT three kinds of protection have been developed: privacy law and regulation, self-regulation (from codes of conduct to Internet filters) and so-called 'privacy-enhancing technologies' (among others encryption).

4.6 Capitalism: rejuvenation and growing instability

According to Manuel Castells (1996, p. 475) capital is global and, as a rule labour is local. He argues that the information revolution contributes to globalization and the concentration of capital precisely by using the decentralizing power of networks. Opposed to this, labour is

disaggregated in its performance, fragmented in its organization and divided in its collective action. The ensuing loss of the strength of labour and the labour movement has led to a reconstruction, we would rather say rejuvenation of capitalism. Henceforward, the value of labour power all over the world can be used. New production and consumption markets, first of all those of China and other emerging markets, have created new sources of profit for capital. The international logistic transport and communication systems required have become so large and complicated that they could not longer be coordinated without ICT.

During the days of the Internet hype many thought that this would lead to a new economy without crises. This thought is a clear case of the idea of a total revolution. However, this expectation appeared to be untenable. There are very few rules and regularities of capitalism that substantially change on account of ICT. All in all, only three can be derived (van Dijk, 1999/2006).

The first is the reversal of the value chain. In electronic commerce the traditional preponderance of supply partly shifts to demand. Consumers become co-producers in self-service.

The second change is the dematerialization and division of the value chain of production, distribution and consumption. All available information belonging to these parts can be detached from the material processes concerned, and divided among separate businesses. Most often these are the most profitable parts of the whole chain. However, along the same track of dematerialization financial assets can also be uncoupled from the so-called real economy. On the financial markets ICT plays a major role.

The third change is a mitigation of the periodic crises of overproduction that haunt capitalism. Electronic stock management and production on demand can lead to more appropriate production planning.

However these innovations have a counterpart. This rejuvenation of capitalism and this uncoupling of 'virtual' from 'real' economic processes also create excessive complexity and instability in the system, despite the stabilisation brought by the mitigation of overproduction. Complexity is increased because the real value of financial products is very difficult to detect in the current far-reaching dematerialization of the value chain. The network society in general and the financial markets in particular have become very unstable because all social and economic processes are accelerated in electronic networks. Behind this acceleration so-called network effects such as power laws ('the rich get richer' etc.) are working (Huberman, 2001; van Dijk, 1999/2006 and Grewal, 2008). Rumours and hypes are built and exchanged much faster than before.

A good example of more instability in the economic system and the role of ICT as a trend amplifier is the current credit crisis. ICT certainly is not innocent to this crisis. However, it is not the deeper cause of it that lies in the nature of contemporary advanced capitalism with its extended financial sphere. In at least three basic ways ICT has amplified the credit crisis:

1. ICT reinforces the volatility and speed of change in the economy. ICT enables yo-yo movements on the stock market and a crowd behavior of ever faster selling and buying on this market. This complicates government and regulatory reaction in case of problems. Fortunately, government reaction was faster than ever before in the current crisis.
2. As has been argued before, ICT reinforces the virtuality and immateriality of economic processes. Without ICTs no financial derivatives (packing, selling and securitization of loans, credit default swaps etc.) would have been possible to the extent they are used now⁹.

⁹ In the 1970s the first derivatives based on the Black-Scholes risk formula/model were automated for an advanced calculator. Soon computers and a computer model were used for this purpose to produce an exponential growth of options and other derivatives.

3. ICT delivers the software for all financial trade and product innovations, including automatic selling and buying.

4.7 Class: growing social inequality

Many social scientists and economists have observed a rise of social inequality, particularly income inequality worldwide, and especially in countries such as the United States since the 1980s (IMF, 2007 and Goldin & Katz, 2008). So, in countries where this trend occurs it precedes the advent of ICT. In this section we argue that ICT tends to reinforce this trend.

Many will have doubts about the assertion that a technology so appropriate to distribute unprecedented amounts of free information and understandable knowledge among the mass of the population would contribute to rising social inequality. Yet this can be shown and explained, provided that one considers ICT as a technology that is able to reinforce the position of some people in societal competition and weaken that of others. So this concerns relative inequality and much less absolute inequality: the complete inclusion or exclusion of access to computers and the Internet.

Without in fact supporting an instrumentalist view of technology – see above- it can be argued that ICT has a leverage effect on existing types of social inequality. Most research of digital media access, that often deals with the so-called digital divide shows that there is a strong correlation between access and personal or positional characteristics of people (Norris, 2001; Mossberger et al., 2003 and van Dijk, 2005). Primarily education, age and societal position appear to be important. Considering physical new media access income still plays a role caused by the regular expenses for purchase of new hardware and software and usage costs that have to be made. People that need ICT for their work or education have a much higher chance of having physical access.

It is important to make a distinction between kinds of access to ICT. Van Dijk distinguishes between four subsequent kinds of access (van Dijk, 2005). The process starts with motivation. Subsequently people will have to attain physical or material access to be able to work with digital media, Than they will have to develop digital skills. Finally, they will make various uses of these media,

According to Eurostat in 2009 60% of the EU 27 population between 16 and 74 years regularly used the Internet. However, there are large differences between European countries ranging from 31% regular internet use in Romania to 86% in the Netherlands and Sweden¹⁰. Also there are significant divides between people with different levels of education, employment status, age and ethnic minority membership. Other digital media such as those for telephony, photography, video and music are used by larger sections of the population. The motivation to work with digital media has sharply risen in recent years. In most European countries all parts of the population, from young to old, and from low to high educated want to participate. The phenomena of computer anxiety and computer hatred have diminished. The biggest access problems are now a lack of digital skills and very unequal use, both in time and in type of applications.

One of the main reasons for unequal use of computers and the Internet is a lack of digital skills. Four types of digital skills can be distinguished. First we have operational skills; the popular expression is ‘button knowledge’. Then we have formal skills. Every medium has particular formal characteristics. Regarding the internet one has to learn to browse and to navigate using hyperlinks. The third type of skill is information skills: the ability to search, select and evaluate information in computers and on the Net. The last type of (so-called ‘higher’) digital skills is strategic skills: using computers and the Internet as a means to reach a particular personal or professional goal (van Dijk, 2005; van Deursen & van Dijk, 2009a

¹⁰ See van Dijk (2008)

and van Deursen & van Dijk, 2009b). Information and strategic skills appear to cause the biggest problems. Only a minority of Internet users master them sufficiently.

Unequal skills next to diverse interests of users are the main reason for unequal use of the Internet by different sections of the population. Usage can be measured in different ways. Among others one can look at kinds of applications such as the classes of information and entertainment. On this issue van Dijk has observed a usage gap of Internet applications between the higher en lower educated in several studies (van Dijk & Hacker, 2003 and van Dijk 2005, 2009). The higher educated primarily use the advanced and 'serious' applications of the Internet that serve their occupational and educational careers, while the lower educated use the simple applications for entertainment, basic communication, shopping and auctions relatively more.

Unequal skills and differential use of the Internet reinforces existing social and economic inequalities. One social category or class benefits more than the other. Again, we are able to argue that the rise of social and economic inequality in the world is a longer existing trend. It has many causes that cannot be discussed here. It has to be noticed that this rise of inequality is bigger in a country such as the USA than in most countries of Europe. In their book *The Race between Education and Technology* Goldin and Katz (2008) have shown with abundant statistical data that except for economic reasons the extent to which the standard of education and the skills learned in education are able to keep up with technological progress explains a large part of growing wage inequality in America after the Second World War. Since 1980 the standard of education lags ever more behind technological development. This causes those who are able to keep up with this development to take a clear lead. This growing gap can also be observed on the level of countries according to the IMF (2007). The use of technology, particularly of ICT is the main cause. Previously, Dutch economists Nahuis and de Groot observed a skill premium on wages on account of ICT skills in a large-scale and longitudinal international comparison (Nahuis & de Groot, 2003). The expression of a race between education and technology indicates that future solutions of this problem have to be found in all kinds of education, both regular and adult education. Almost everybody has a need for better information and strategic digital skills. Seniors primarily need operational and formal digital skills.

4.8 Politics: civil emancipation and the rise of populism

In the past 25 years organized participation in society gradually has declined in many countries of Europe¹¹. Generally, voluntary work in associations also is diminished. In this period, already starting before the breakthrough of the Internet and ICT in general on a mass scale, a clear shift has occurred in kinds of societal participation. The trends are from institutional to personal participation and from physical to virtual or mediated participation. Both trends have been reinforced by the coming of the Internet.

Institutional participation is membership of political parties, trade unions, churches or other large-scale societal organizations, voting or working for these organizations and attending their meetings. This kind of participation has steadily been replaced by a more personal kind that is no more or less than an epiphenomenon of individualization. Personal characteristics, interests or concerns are deciding, not group identities given by birth and kept all life. Conversely, these persons increasingly approach societal organizations in a functional and anonymous way. Membership cards are exchanged for check-book donations. These organizations have come to be seen as facilitators for individuals or citizens. This does not rule out personal contributions.

This businesslike and individualized approach of societal organization would have occurred without ICT. After all, check-books and donations are age-old technologies. And the telephone precedes the Internet as an online medium. This kind of personal citizen

¹¹ For example, data on the Netherlands can be found in: Dekker et al. (2004)

participation perfectly fits into the contemporary age of individualization and emancipation. However, the Internet and ICT in general do enable individualized citizens to keep in touch with society much better than before. They are able to be kept informed, to exchange knowledge, to discuss views with other individual participants, to draft petitions and to be served with transactions and advice by professionals of the organizations they are linked to. Here the transition is made from physical to online participation. For many years now it has been argued that online participation would be able to compensate for declining collective and institutional participation, in the way virtual communities would revitalize traditional communities. Most data show that this does not occur. ICT does not cause more political and societal interest among citizens, no higher turn-out with elections and no higher membership for political parties, trade unions or churches (Katz & Rice, 2002 and Ward & Gibson, 2009). However, online activities contribute to the individualized kind of participation and individual citizen emancipation described. The contemporary citizen acts from his/her own environment and experiences and s(h)e inserts these experiences in public opinion, among others the online public sphere. There is less deductive reasoning from collective political, social or cultural interests.

In politics this has lead to the rise of populism in election campaigns and in parliamentary work. Increasingly, political candidates directly address individual citizens as persons, not as members of parties or other organized collective interests. Both more candidates and more voters or citizens prefer this personalized attitude. Political parties evolve from program parties and parties of elected executives to campaign parties. The campaign party supports the popular leader as a person with attractive single issues.

What is ICT contributing to this development? It certainly has not caused it. The rise of populism and the campaign political party took place in the age of television democracy and politics starting in the 1960s. Just like the program party was linked to the age of press democracy and politics before. In that sense McLuhan's expression 'the medium is the message' still carries some truth. However, the role of persons in politics and the media has much deeper roots than in the media only, according to the psychology and sociology of culture. It does not only belong to the epochal trend of individualization described, but also relates to the desire of intimacy and personal expression in an alienating mass society (Merelman, 1984 and Hart, 1994) and to the fall of public man in the privatized modern economies and societies (Sennett, 1977).

Once again, the Internet and ICTs mainly reinforce these trends of citizen emancipation and the rise of populism. Henceforward, favourite political persons and single issues can be consulted and supported by individual citizens on specialized websites. Slowly, but surely the age of Internet politics is approaching. It has not yet supplanted the age of television politics but in the USA and in Northern and Western Europe election campaigns are drawing to the Internet. Recently, Barack Obama could build a large online grass-root support and enormous funding via mainly small online donations. However, it should be noticed that he has spent by far the largest part of campaign funds to television ads and that face-to-face door-to-door propaganda and rally meetings were prominent parts of his campaign as well. So, the integration of online and offline activities discussed above seems more like the future of politics and elections than a replacement by ICT activities alone (Ward & Gibson, 2009 and Davis et al., 2009).

4.9 Culture: the rise of participation in the media

A rise of participation in the mass media is a trend that precedes the Internet. From the 1960s and 1970s onwards the number of letters by readers of newspapers and magazines started to rise. Many young people applied for their favourite music numbers on the radio. From the 1960s onwards one of television viewers greatest desires was to personally appear on television to have their '15 minutes of fame' according to the 1960s Pop Art artist Andy Warhol.

With the advent of the Internet the opportunities of participation in this medium and others sharply increased. In the perspective of so-called Web 2.0 and the rise of participatory new media such as weblogs, wiki's, social media (for social networking) and online civic journalism opportunities have again grown in the last five years. However, in the Web 2.0 perspective the individualized kind of participation described above is provided with a touch of utopianism that we know from the time of the rise and hype of the Internet. Once again the Internet is seen as an empowering medium for users. This time users are expected to be able to create alternatives to institutional politics, the traditional mass media and knowledge institutions together with other users. Institutional politics is supposed to be ready to be replaced by forms of direct or teledemocracy, the traditional mass media by civic journalism or on demand media and the established knowledge institutions by peer-to-peer networking or wiki's. These expectations presuppose the following five characteristics of the Internet as a:

- *interactive* medium that departs from the one-sided communication of existing mass media;
- *active and creative* medium enabling users to transform from viewers, listeners and readers to participants;
- *direct* medium in which individual users to determine at a distance what happens in the centre (of among others politics and the mass media);
- *platform* on which everybody is equal in principle as assumed expertise has to prove itself before being accepted;
- *network* medium enabling the collective creation of products online, not primarily by individual authors or businesses.

All these assumed characteristics exist to a certain extent. However, each one of them can be contested too. The Internet has substantially changed in the last ten years. The share of user-generated content has markedly increased by means of the number of personal websites, weblogs, chat boxes, online forums, contribution to online newspapers, journals and broadcasters, so-called wiki's, exchange sites for (partly self-created) music and videos and finally profiles in social networking and online dating. But that does not mean that the Internet is sufficiently interactive for, among others, customer and citizen support. This still is massively given by call centers and service desks. Neither are online media on the Internet flooded with contributions of users. The relatively passive and consumption use of online contents still is much larger than the creative contributions. In 2006 downloading and exchanging online contents was three times as popular in the US than creating own contents (The Pew Internet and American Life Project, 2007). Apart from chatting, profile sites and the like 'serious' website contributions are provided by less than twenty percent of Internet users (*ibid.*).

That the Internet is a direct medium which serves as a platform and locus of exchange of knowledge, views and products of culture, such as music and video files does not imply that experts or intermediaries (editors, moderators, educators, researchers and advisories) have no function anymore. On the contrary: the information overload and the inferior quality of much Internet content require more, not less intermediaries. Only those who accept or agree to the abundance of low-quality content on the Internet would support the view that they are

not needed anymore. In his book *The Cult of the Amateur* Internet critic Andrew Keen (2007) has argued that opinion is sold as fact, rumor as reportage, and insinuations as information. He claims that on the Net differences between information, advertising and sheer nonsense are blurring.

Finally, it has to be emphasized that networks, among other peer-to-peer networks are shaping a third mode of organization in the economy and in governance besides the hierarchy and the market, indeed (Benkler, 2005; Tapscott & Williams 2006; van Dijk, 2006 and Sunstein, 2008). However, this is not to say that it will become the predominant mode in the near term. The established economic and political institutions, the market and regulation will also keep playing an important, if not decisive role on the Internet of the future.

After the quality of user-generated content on the Internet the actual participation in the production of this content is another overrating that has been made in the Web 2.0 perspective. Serious user-generated content that could play a role in politics, the business world and societal participation is delivered by a minority of people with high education. One will not find many weblogs and much civic journalism among the average of the population. Here one does find the exchange of music files, videos and photos. This is an instance of the usage gap that was discussed in a former section.

So, we are able to conclude that the Internet extends the opportunities of societal emancipation and participation. However, those who were already frontrunners in participation, the higher educated and those motivated to participate, benefit a lot more from these opportunities. This means that existing (relative) inequalities will remain, if not increase (see above). Users will not overtake the power of mass media editors. Institutional politics will not be swept aside by direct teledemocracy. Finally, it would be inconceivable for the extremely complex society we are living in that expert knowledge would be overrun by the lay knowledge of 'wise crowds'. These instances of a revolutionary transformation caused by ICTs will most likely not occur.

4.10 Daily life: increasing choice opportunities

With the growing prosperity in affluent societies, the increasing complexity of modern life and the individualization of social living the number of choice obligations and opportunities in daily life have multiplied. Evidently, ICT very much enables to conduct a life with so much complexity and choice. Perhaps the most important technological capacity of the new media next to speed, virtuality and interactivity is selectivity: the capacity to make choices among a seemingly endless number of products, contents and contacts (see van Dijk, 1999/2006). The menus of choice in hyperlinked websites, both informational and commercial seem to be endless.

However, once again we should be aware of the fact that increasing choice opportunities and needs precede the advent of ICT in contemporary society. They are derived from the following epochal trends in Western society.

As has already been discussed the individualization of daily life between and within ever smaller households has grown during the whole twentieth century and has accelerated in the 1960s with cultural emancipation and the rise of a youth culture. This life requires that individuals are able to make continuous choices for themselves. After the Second World War (mainly) young people started to make their own life and emancipate from their families and communities. The new media have only intensified this trend. The sharp rise of mobile telephony use is an indication of the need to connect individuals, rather than households. Presently, even children and young teenagers are individualizing themselves from their families in their own rooms equipped with a computer, telephone, stereo and Internet connection.

The second basic trend is the increasing complexity of all spheres of life in modern society. Tasks at work, in education and in leisure or family life have become more complicated and

more difficult to coordinate. In the course of the twentieth century all kinds of information and communication means have been invented and introduced to cope with this complexity. ICT is just the latest of these means, though a much more powerful means for the coordination of modern life than those offered before. Not only mobile and fixed communication means are used for that purpose but also all kinds of information agent software. They range from search engines, price comparison sites and online dating profiles to self-therapy for mental and relational problems. But it must be noted that library assistants, consumer guides, marriage counsellors and therapists have performed similar functions.

The time compression and speed-up of modern living discussed before cause a further trend that was already visible before the advent of ICT: the intensification of daily life appearing in ever more busy daily schedules and the rise of an experience economy in culture. ICT supports this trend with all kinds of electronic calendars, contact lists and lists of favourites. Though they make daily life outside work more businesslike their use seems to be inevitable for most people. ICT further enables the trend of intensification with multimedia and virtual reality experiences. Computer games have become one of the most popular new media applications. They add to much older massive music, dance and theatre events, (sport) games, cinemas and individual media games introduced in the last century.

The most basic material trend is the abundance of products and services of mass consumption of increasingly prosperous developed societies. Mass consumption has two sides to it that are both supported by ICT. They are the differentiation and the standardization of products on large-scale markets. Long before the rise of ICT mass markets already contained a rising number of products and services. This variety could be supplied because production processes and product forms were standardized in mass production. With the introduction of ICT both differentiation and standardization could be supported. Most contemporary products and services to be chosen in online supply are just variants of the same basic product. The favourite choices of consumers are first marketed with techniques of segmentation and subsequently by personalization.

The rise of self-service in consumption was already prevalent in the twentieth century economy before, for example in supermarkets and hobby practices such as sewing and knitting at home. With e-commerce, online public services and online distance education self-service has multiplied. This has stimulated another, more active kind of consumer that is sometimes called 'prosumer'. Co-creation of products and services in networks is not an entirely new phenomenon but it certainly is proliferated in the (peer-to-peer) networks of ICT.

4.11 General conclusions

In this section it has been argued that the social impact of ICT has no revolutionary but an evolutionary nature. From a technical point of view ICT may be revolutionary, but her societal impact is not of that nature. This does not rule out that ICT contributes to important societal transformations. With ten contemporary trends it was observed that they are reinforced by ICT. Without ICT they would also have occurred, though to a lesser extent. This would have led to major problems in a number of societal domains such as a congestion of social and economic exchange and all kinds of organizational processes. These problems will be identified in the domain reports that come after this conceptual framework.

The non-revolutionary impact of ICT on society follows a historical pattern that has been observed many times before. Brian Winston speaks about the 'law of the suppression of radical potential' in the history from the telegraph, the telephone, radio and television through the Internet (Winston, 1998). On every occasion the anticipated revolutionary potential of a new communication technology is incorporated in existing societal relations after having become mature. Isn't that what happened with the Internet after the utopian prospects that came forward in the 1990s and the days of the Internet hype?

Again, this does not rule out important societal transformations on account of ICT. Only, they are still largely unknown. Currently, we can observe a number of tendencies that will be

extensively analysed in this report. Often these tendencies are opposed, such as with each technology of freedom and control, or every technology that requires compromises, such as between privacy and security in this case. The advantage of this state of affairs and a dialectical view of technology is that important choices can still be made and that many policy options are still open for us to choose.

5 Common Themes and Questions

To find the potential long-term transformations on account of ICT we have to dig deeper. We will have to identify a number of common themes that will be discussed in all ensuing domain reports. These common themes are very basic social (infra)structural characteristics and goals of contemporary European societies. They are the themes to look at when we describe the impacts of ICT in the societal domains. We have identified four common themes:

5.1 Rationalization (effectiveness, efficiency, innovation)

This goes for the organizational aspect in all domains. It does not only concern production systems and the economy, but also consumption patterns and everyday life. For instance, partly on account of ICTs everyday life has been found to become more business-like as well. Think about the effects of electronic calendars and explicit choice or preference lists in profile sites and online dating.

Rationalization as a theme enables the domain report to look for the objectives in a particular domain, already present before ICT arrived but subsequently more or less supported by this technology. Further, it forces us to look at the costs the use of ICT requires as a means. Are the costs of this means worthy of the achievements?

Finally, ICT is some kind of innovation. What is the innovative capacity of ICT as compared to old activities and techniques?

This inspires the following questions each of the domain reports will try to answer:

- What are the traditional goals in term of effectiveness in the domain under consideration? Has the introduction of ICT brought these goals closer?
- What ICT expenditure has been made in the domain? Did it bring the expected returns yet in terms of efficiency, or are the main results still to come?
- Have the ICT applications in the domain only brought forward technological innovation or also social and organizational innovation?
- When the domain is non-economic in its nature – because it is in the social, political, cultural, education or health field- has the introduction of ICT reinforced businesslike approaches of calculation, registration, economic measurement and management control?

5.2 Networking and Social Capital

In all domains the (social) infrastructure of activities is changing on account of the networked character of present-day ICTs. A physical classroom produces different social networks than online education. Policy formation in meeting rooms is different from online forums. Telemedicine hospital treatment engages other doctor-patient exchanges than physical doctor, nurse and patient interaction. The specific properties of networks (such as network externalities), in combination with the particularities of (digital) information goods when compared to tangible goods, imply that network creation is one of the main underlying principles for transformative “impacts” of ICT. We argue that most transformative change of ICTs will be in the relations and the resources we derive from them in the information and network society. This also contributes to changes in social capital.

This inspires the following questions each of the domain reports will try to answer:

- To what extent is the domain under consideration already networked? Or does it still largely consist of separate entities that are either not online or that still work offline most of the time?
- Has networking changed the organizational structures in the domain? Has it lead to new roles, functions, jobs or organizational positions of people working in the domain?
- Can particular network externalities be observed in the domain? For example: has a critical mass of online connectivity already been reached? Is there a call for common standards or protocols for the networks used in the domain? Are power laws observed such as strong actors becoming even stronger by means of networking or are so-called ‘long tails’ occurring: the availability of a great diversity of choice in small numbers?

Many expect that ICT will affect the distribution of social capital and the strength of social cohesion in society. Social capital is defined here as “... *the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit*” (Nahapiet & Ghoshal, 1998). High stocks of social capital in a particular society, nation state, region or local community are associated with relative ease of the sharing of knowledge and expertise, with community building and social cohesion.

Woolcock (2001) has proposed three types of social capital:

- bonding social capital, i.e. strong ties between like people (or organisations) in similar situations;
- bridging social capital, i.e. more distant or “weak ties” of like persons (or organisations);
- linking social capital, i.e. weak ties which reach out to unlike people/ organisations, such as those which are entirely outside of the community or in a different sector.

This inspires the following questions each of the domain reports will try to answer:

- Can a particular growth of social capital be observed in the particular domain? 2. Does social networking contribute to improvements or degradations in the domain according to accepted norms or values?
- What type of social capital presently dominates the domain: bonding capital (strong ties of similar people), bridging capital (weak ties of similar but distant people) or linking capital (weak ties of unlike, mostly distant people)?
- What is the role and what are the achievements of so-called social or participatory media (see trend 4.8 above)?
- Does ICT lead to more or less social cohesion in relevant communities of the domain (e.g. health, education, leisure and resident communities)?

5.3 Empowerment and participation

The common scientific and public opinion expectation is that ICT will change power relations in many, if not all domains in society. Some think that centralization will occur, but most think decentralization will happen. The most popular expectation is that ICT is empowering users of all kinds: citizens, consumers, workers, patients, students and audiences. Here the main question is: Do/will ICTs substantially change the relations between governments and citizens, producers and consumers, doctors and patients, teachers and students etc? Increases in participation and empowerment could be

understood as key elements of beneficial, transformative change, but ICTs can potentially also be used to curtail participation and individual freedoms.

This inspires the following questions each of the domain reports will try to answer:

- What has been expected of a change of relationship between the most important actors in the domain and what has actually occurred? Have those in power yet reached more power in their control of design, investment and implementation of ICT or can a bottom-up trend be observed? Is the popular expectation true that users and user-generated content increasingly define what happens in the domain?
- Has the *nature of the relationship* between governments and citizens, producers and consumers, managers and workers/employees, doctors and patients or teachers and students changed on account of ICT?
- Has ICT increased participation of citizens, consumers, workers, patients and students in goal settings and in the ways goals are being pursued?
- What is the level of access to ICT (primarily computers and the Internet) in the domain under consideration? This question goes for at least three types of access: 1. physical access to computers, the Internet and other digital media; 2. digital skills and 3. use: the quantity and quality/ kind of applications.

5.4 Information and Lifelong learning:

The meaning of the concept information society is that in all human activities and in all domains information intensity is increased. This implies that a growing part of all activities, in work and leisure time, and obviously in education consists of searching, collecting, processing, evaluating and applying information. Among others this means that the number of pure information jobs is growing and that the other jobs contain ever more information processing. This requires lifelong learning both on the job and in special adult education. It is important to know that the growing role of information processing and the information society in general already started long before the coming of ICT. It is linked to the rise of literacy, science and scientific management since the industrial revolution (Beniger, 1986).

Obviously, ICT strongly supports the opportunities of lifelong learning, both on the job, in formal education and in leisure time. Referring to leisure time is important as presently people, especially young people learn a lot from using computers, the Internet and other new media outside formal educational environments. Learning is not only aided by the innumerable sources provided in this way by ICT but also by networking, both in professional knowledge networks and in social networking. In all domains knowledge networks, more in general information exchanges via digital media are growing. This enables new ways of learning by cooperation and association. Again, it is important to argue that so-called 'new learning' in schools, departing from classical classroom education is not only related to the new opportunities brought by ICT but has much broader cultural roots in processes of individualization, cultural differentiation and emancipation.

This inspires the following questions each of the domain reports will try to answer:

- To what extent have information jobs and information activities grown in the domain under consideration? What are the typical ways of information processing and exchange before and after the introduction of ICT?
- What is the relationship between professional and lay information processing or learning in the domain? For example, how do teachers and students, doctors and patients, civil servants and citizens, managers and employees learn and exchange the results of learning. Do applications of ICT support these ways of learning?
- What are the opportunities of learning with the aid of ICT in the domain? What is the role of peer-to-peer networking at all levels? What are the opportunities of computer

- interfaces in interactive learning for students, workers, consumers, citizens, patients etc.?
- Does ICT only support so-called ‘new learning’ by individual and network interaction and association or also more traditional modes of knowledge transfer (classroom and unidirectional learning)?

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[A] Participation in Policy Making

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0 Executive Summary

This domain report makes an inventory of the impact of ICT on public policy making in contemporary European societies. This issue is known as **e-Participation**.

Policy participation is defined here as *taking part in public affairs by both governments and citizens trying to shape these affairs in a particular phase of institutional policy processes, from agenda setting through policy evaluation*. Traditionally, participation in public policy processes shaped by governments is approached with a government-centric view. Until recently, most initiatives in e-Participation came from government employees and politicians trying to involve the citizenry in public and political affairs with applications of ICT, mostly Internet applications. In the last five years a significant change has occurred. Now citizens themselves can take the initiative to influence public and political affairs with freely available new Internet applications. Here both government and citizen initiated applications will be discussed.

Government invitations of citizens to participate in policy making and the motivation of citizens to participate certainly are not new. They became an ever more important part of governance in modern democratic societies since the Second World War. Now the opportunities and threats of using ICT for this purpose (e-Participation) can be discussed.

The domain report describes the following **thirteen applications of e-Participation** in policy making in the order of the general phases of the policy process.

Agenda setting

1. Open Online Consultations (governments and public administrations)
2. E-petitions and E-activism (citizens)

Policy Preparation

3. Online Plan Consultations (Governments)
4. Online Forums for Policy Making (Citizens)
5. Online Knowledge Communities and Social Media serving Policy Making (Citizens)

Decision Making

6. E-voting (governments; election committees)
7. E-campaigning (citizens and politicians)

Policy Execution

8. e-Maintenance of the Law (by citizens invited by governments)
9. e-Government services following the needs of citizens and including participation (government initiative)
10. e-Government services with participatory user-design (government initiative)
11. E-complaints and e-surveillance (initiated by citizens)

Policy Evaluation

12. Quality panels and individual evaluations of online public services (government initiative)

13. Citizen control sites and information services for public or government policy (citizen initiative)

The report comes to the following **main conclusions**:

Influence on policy and politics

Currently, scarcely any influence of e-Participation projects or experiments on institutional policy and politics can be observed. Few decisions of government, political representatives and civil servants have changed on account of the input of citizens in e-Participation. The electronic channels of participation used are simply added to the traditional channels. Decision makers doubt the representativeness, surplus value and quality of the input of the new channels. Few decision makers are prepared to accept the direct inroads of e-Participation on their decisions.

Policy phases emphasized

E-Participation is most frequently used in the first phases of the policy process: agenda setting and policy preparation. Policy evaluation is a second area, mostly entered on the initiative of citizens (organizations). Governments and public administrations rarely allow entries to the core decision making and policy executing phases. They claim that this does not correspond to our representative political system and the responsibilities of the public administration

E-Government and e-Participation

Thus far, e-Government seems more successful than e-Participation. In opinion polls citizens reveal a positive attitude to the improved electronic information provision of governments and administrations and to the public services of e-Government. Opposed to this, they are sceptical, sometimes even cynical about the Internet's effect on the behaviour of politicians and public officials and about its potential of having more to say in government affairs.

Closing the Gap?

The main motive for governments and public administration to start experimenting with e-Participation is to close the gap that is perceived to be growing between governments and citizens and to boost the legitimacy of government policy and administrative decisions. So far, this has not occurred. This is both on account of the sceptical attitude of many citizens and of the unconvincing reactions of political representatives and civil servants to the results of e-Participation projects. Research indicates that many citizens are prepared to accept and take part in e-Participation projects provided that governments and administrations clearly take the input of citizens into account and provide feedback to citizens about what they have done with their input in their final decisions.

Government or citizen initiative?

The study of e-Participation applications raises the suggestion that applications of e-Participation on the initiative of citizens or civilian organizations and new media developers are more successful than those initiated by governments. E-petitions, e-voting guides (made by independent organizations of politically motivated citizens and software developers), e-complaints, e-surveillance and citizen control sites are more popular than online open and plan consultations and official online discussions. Official e-voting also still is in its infancy.

Traditional political or everyday life issues?

Applications of e-Participation that appeal to the everyday interests of citizens in their own environment might have more appeal to them than traditional issues of politics and public affairs that are abstract and far away. Others support this hypothesis: "Increasingly, the focus appears to be on issues that 'people really care about', such as social security, health, education, environment, and, as mentioned above the very immediate, daily issues".

The following **policy suggestions** are made:

1. Clarify goals and means of e-Participation projects and evaluate systematically
2. Clarify rights and responsibilities of e-Participation stakeholders
3. Clarify the background views of democracy (participation and representation).
4. Adapt government and public administration to incorporate e-participation; develop transparency and responsiveness.
5. Pay more attention to e-Participation in the area of everyday issues of citizens
6. Tune government initiatives to citizen initiatives
7. Provide reliable and usable information
8. Stimulate innovations of hardware and software enabling e-Participation
9. Develop demand-side strategies for the improvement of e-Government online public services and try user-centred participatory design.
10. Stimulate the widest participation among the population

1 Introduction

This domain report makes an inventory of the impact of ICT on public policy making in contemporary European societies. This issue is known as e-Participation. However, this is a very broad concept that can be applied to the participation of people in all kinds of domains in society both public and private. Participators could be workers or employees in labour organizations, patients in health care, students and teachers in educational institutions and audiences in the media. This report focuses on citizens that participate in public life that is under the influence of governments and that try to shape this part of public life using tools of ICT, particularly Internet applications.

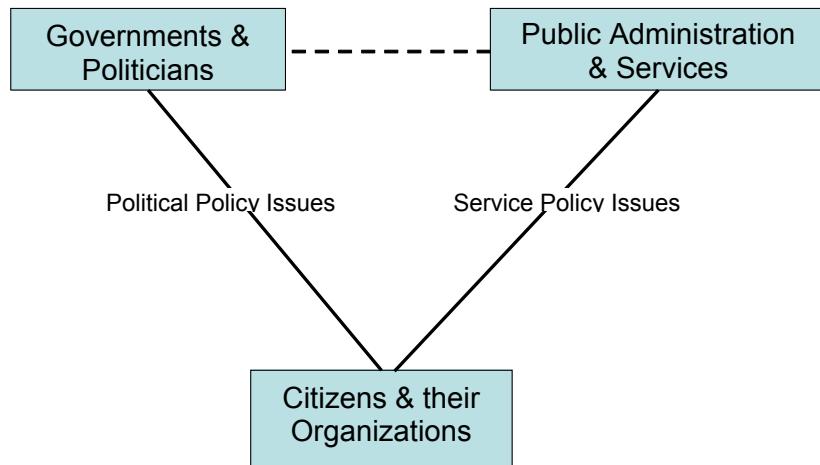
This focus is still too broad. Meijer and Bekkers (2009) have distinguished between political participation, policy participation and social participation. This domain report will be about policy participation and it will frequently also refer to political participation. Social participation that focuses on building social capital building in social networking and communities will be discussed in the domain report about the Community and the Family. In the domain report you are reading participators will be called citizens and the venues in which they participate - that range from elections and consultations to the use of public services- can be both offered by governments and their civil servants or by citizens themselves. All have public goals, some have political goals.

Policy participation is defined here as *taking part in public affairs by both governments and citizens trying to shape these affairs in a particular phase of institutional policy processes, from agenda setting through policy evaluation*. Traditionally, participation in public policy processes shaped by governments is approached with a government-centric view. This means that all initiative to invite and pressure citizens to take part in policy processes came from governments and institutional political parties. More or less autonomous initiatives and actions from individual and collective citizens to influence public affairs or governments have not acquired much attention from politicians, civil servants or social and political scientists.

This also goes for e-Participation (see Macintosh, 2007). Until recently, most initiatives in e-Participation came from government employees and politicians trying to involve the citizenry in public and political affairs with applications of ICT, mostly Internet applications. In the last five years a significant change has occurred. Now citizens themselves can take the initiative to influence public and political affairs with freely available new Internet applications. Most of them are known under the labels of Web 2.0 and so-called user-generated content. In this report the government centric view of e-Participation will be exchanged for a two-sided government and citizens view. Both government and citizen initiated applications will be discussed.

According to Sæbø, Rose and Skiftenes Flak (2008) "governments may seek to promote participation in order to improve the efficiency, acceptance and legitimacy of political processes. Citizens, non-governmental organizations, lobbyists, and pressure groups may demand participation to promote their own interests, either within the established political system or outside it through activism and opinion forming."

In conclusion, the following picture emerges as the domain of e-Participation in policy making by citizens and their organizations, governments and politicians and public administrations and their services. E-Participation can be defined as *the use of ICTs to mediate and transform the relations of citizens to governments and to public administrations in the direction of more participation by citizens*. The issues at stake are not only political issues in the broadest sense, but also public service issues that shape the day-to-day relationships between citizens and the state at large. Relations between governments and public administrations belong to the internal dimension of e-Government. Figure 1 shows these relationships.

Figure 1: Relations and Issues of E-participation on Policy Making

This report focuses on the relationship between citizens and their organizations and governments/ politicians respectively public administrations and services. In almost every definition of e-Participation the relationship between citizens and governments or between the political or administrative sphere and the public sphere of civil society receives the core interest. Ten stakeholder groups of e-Participation have been listed by the DEMO-Net project (Tambouris, 2007):

1. Individual citizens
2. Elected representatives, parliaments
3. Government
4. Political parties
5. NGO's, CSOs, organised interests
6. Citizen groups
7. Academia/ Research/ Think-tanks
8. Business / Industry
9. Mass communication media
10. Other public sector partners or quasi NGOs etc.

This report will discuss the role of stakeholders 1 through 4 and 6. The focus of this report is already very broad and going into the role of NGOs and stakeholders 7 through 10 is not the principal focus of e-Participation according the literature (see Sanford & Rose, 2007).

Further it must be stated in advance that the implications of ICTs for the participation in policy making can be discussed at two levels, a more generic and a more specific level. The first level is related to internet as a "generic" communication tool that could be, and already is, used to facilitate circulation of information inside every type of organization and also to diffuse information to a wider audience. In this way processes of information exchange are accelerated and internationalized. These processes can also be used to organize, that is to mobilize and coordinate citizen participation and political action in several domains. At a second level more specific applications of the use of ICT in policy making in the political

sphere can be described. This report focuses on this second level as here the impact of ICT in policy making can be observed in a very concrete and detailed way. Other domain reports, specifically the Eurobarometer analyses and the sections about empowerment and participation in the other domain reports extensively discuss the general level of participation by e-inclusion and by self-organization.

Before the extensive treatment of applications of e-Participation in section 4 of this report two sections will follow. First we will describe the rise of attention for e-Participation against the backdrop of much longer existing societal trends of civic participation. This goes in line with the approach of the Conceptual Framework. Part of the matter is not new at all and the opportunities of electronic venues of participation have to be compared against comparable older ones and related to the current needs and capacities of citizens.

The ensuing section 2 will describe the advent of ICT in this domain during the 1980s. Further, it will give an historical overview of the expectations of the opportunities and threats of ICT tools in policy participation by governments and citizens developed from the 1980s to the present. Here we will also summarize six general views of democracy that usually hide behind these expectations. Particular views of democracy happen to be more in favour of some applications of e-Participation while other views back other applications.

The long empirical section 3 will give an overview of the characteristics, the use and the expectations regarding the most important applications of e-Participation in policy making. They will be arranged in the framework of the general phases of the policy process: 1. agenda setting, 2. policy preparation, 3. decision making, 4. policy execution and 5. policy evaluation. In every phase both government initiated applications and citizen initiated applications will be described.

In section 4 the common themes for all domain reports announced in the Conceptual Framework will be addressed. In the domain of participation in policy making we also have rationalization (effective policy making), networking (peer-to-peer networking citizens, civil servants and politicians), empowerment (of citizens and governments), social capital (differentiation or homogenization) and lifelong learning (user-generated content and collective intelligence).

Finally, section 5 will present the general conclusions and policy suggestions for decision makers to benefit more (according to their views) of e-Participation by the citizens in their domain.

2 Epochal trends and the arrival of ICTs in the domain

2.1 *Epochal trends: the participation of informed citizens in contemporary society*

Government invitations of citizens to participate in policy making and the motivation of citizens to participate certainly are not new. They became an ever more important part of governance in modern democratic societies since the Second World War. Especially in the 1960s and 1970s a wave of interest in democratizing all domains in society launched by young people of the 'protest generation' could be observed. In those decades the power of traditional authorities began to crumble. Authority was no longer taken for granted. Henceforth it had to prove itself continually, not simply by claiming it, but through action and by communication with the subjects concerned.

After 1990 institutional participation by membership of political parties, trade unions and churches started to decline while membership of organizations for the protection of the environment increased. Voting or working for the first mentioned organizations and presenting their meetings also diminished. Gradually, this kind of participation was replaced

by a more personal kind in all societal organizations (see for example Inglehart, 1999). This can be seen as an epiphenomenon of individualization (Inglehart, 1977). Personal characteristics, interests or concerns came forward, not group identities given by birth and kept all life (Dekker et al. 2004).

The following longitudinal trends of participation can be observed:

- Individualized societal participation

In the modern mass society of the 20th century the percentage of members of societal organizations with only paper list membership has substantially increased. Subscription payments, donations and occasional postal votes for organizational elections became partial substitutes for meetings and physical efforts of organizing, recruitment and fundraising. This participation at a distance signifies a focus on the individual and on individual members in organizational thinking instead of a focus on the organization as a collectivity.

- Collective intelligence and action at a distance

Action at a distance in the 20th century was already practiced long before the advent of the Internet using the telephone, the checkbook, radio calls and letters to newspapers. Discussions in newspapers and on radio and television channels were modern forms of collective intelligence exchanged in the mass media.

- Emancipation drives (of youth, women and minorities of all kinds)

In the 1960s and 1970s emancipatory movements of youth and females became a mass phenomenon. With the arrival of a substantial number of migrants in European countries starting about the same time minority interests were brought forwards. These emancipatory drives were part of more general calls for democratization. These drives and calls have gone up and down in the past four decades, but they have regularly spurred the call for participation in official policy making of governments and societal organization.

- Democratization (of labour organizations, educational, health and welfare institutions, community and cultural organizations and the media)

So, the same happened to societal organizations. Participation in policy making was not only a political affair but it became part of many more large-scale organizations and communities. Works committees, school and university councils, patients and consumer organizations have institutionalized since the 1960s.

- Rise of informed citizenship

In this way many citizens became emancipated and to be emancipated they had to be informed. Citizens informed themselves by rising levels of literacy of all kinds and by media to produce a society of lifelong learning. Those who ran behind were supported by types of adult education that went far beyond the traditional schooling of illiterates.

- Differentiation of citizenship

The final trend to be described is the differentiation of citizenship. Increasingly it is acknowledged that THE citizen does not exist. In the strongly differentiated post-modern society no citizen is equal and every individual differs from any other in a particular position or characteristic. This was the basis for the segmentation of consumer markets by marketers from the 1950s onwards, to be followed by personalization. Currently, governments are following the marketers and first attempts are made to approach citizens with techniques of segmentation and personalization.

This short historical description was made to emphasize that these trends clearly preceded the advent of ICTs (see for example Dalton 1996). Following these trends people used traditional organizational and media means that were adequate at the time. The arrival of digital media only brought a number of new opportunities and risks in realizing these trends.

2.2 The arrival of ICTs and the opportunities of e-Participation

2.2.1 Transformative capacities of ICTs

In the 1980s ICTs arrived on a massive scale with the introduction of the PC with a relatively simple operating system and popular software in workplaces and households. The Internet appeared in academic circles. Immediately these technologies appealed to the imagination of future watchers, scientists and the early adopters of these technologies to launch more or less utopian visions of the future, among them in the field of politics and policies. The following characteristics of computers connected in networks (the Internet) were thought to have revolutionary or at least transformative implications for the democratization of politics and society at large (see Conceptual Framework); the Internet was seen as a:

- *interactive* medium that departs from the one-sided communication of existing mass media;
- *active and creative* medium enabling users to transform from viewers, listeners and readers to participants;
- *direct* medium in which individual users can determine at a distance what happens in the centre (of among others politics and the mass media);
- *platform* on which everybody is equal in principle as assumed expertise has to prove itself before being accepted;
- *network* medium enabling the collective creation of products online, not primarily by individual authors or businesses.

Imaginations were often framed in the perspective of a total revolution, a technological fix or as instruments that would overturn institutional politics and modes of policy making. See Conceptual Framework

2.2.2 Perspectives of transformation

Four waves of these more or less utopian perspectives can be distinguished in the past decades:

1. In the 1980s the *teledemocracy* perspective came forwards (notorious authors: Ch. Arterton, Th. Becker, B. Barber¹). The Athenian agora was the most important source of inspiration for the idea that in networks citizens can perform politics and determine what happens in the centre of society working from their Internet or cable TV terminals. The expectation was that the removal of space barriers in ICTs and their central storage capacity would enable forms of direct democracy without intermediaries such as parties and representatives.
2. In the early 1990s a *virtual community* perspective appeared (a.o. Rheingold 1993). In this perspective the rise of usenet groups and other online communities would stimulate both online communities (communities of interest) and communities online (supporting existing physical communities). Main expectation was that these virtual communities could make up for 'lost community' in modern society (the crisis of traditional village and neighbourhood sociability).
3. Around the turn of the century was the time of the *Internet hype* after a massive spread of the Internet in society. Here visions of a '*new democracy*' came forward that were equivalent to the vision of a '*new economy*' (a.o. Shapiro 2000). The basic idea was the prospect of mass participation in politics and policy making via the Internet. In some visions citizens could even bypass institutional politics and the state to create their own political and policy reality. From the perspective of governments first experiments were

¹ See Arterton (1987), Barber (1984) and Becker (1981)

waged in online consultation and debate of citizens considering government plans. The main expectation was that this would broaden participation.

4. From 2004 to the present: *the Web 2.0 perspective*. Observing the sharp rise of social and participatory use of the Internet by (co-)creative Internet users producing user-generated content it was expected that citizens would increasingly contribute to policy making in all kinds of ways: with online petitions, weblogs, civic journalism, wiki's (collective intelligence) etcetera (a.o. Leadbeater 2008). The main expectation is that a multitude of creative contributions of user-generated content will appear.

2.2.3 The background: views of democracy

Behind these expectations of the potential aid of ICT to the participation in policy making clearly lie different views of democracy. Some support individual contributions in a teledemocracy referendum style, others stress discussion or debate and again others community building and inclusion. It is very important to make these views evident from the start. Six views of democracy will be distinguished here. They will be linked to their favourite applications of e-Participation (van Dijk 1996).

1. Government-centric views

The classical Western view on democracy is *legalist democracy* – a so-called procedural view of democracy, regarding the constitution and other laws and rules as the foundations of democracy. Here a small, but strong and effective state is preferred. In this view e-Participation of citizens can help to improve public support for the government and the administration by offering more and better information in both directions.

The second conception of democracy is called *competitive democracy*. It is mainly supported in countries with a two-party or a presidential system. According to this view, parties and leaders compete for the support of the electorate. This rather elitist view of democracy emphasizes representation and efficient decision-making by leaders. Digital media are first and foremost used for information campaigns and election campaigns.

2. Citizen-centric views

Four other views of democracy have a completely different strategic orientation. They are not government-centric but reason from civil society. Supporters of these views fight for a socialization of politics. This implies a more prominent role for social organizations and individual citizens. The assumption is that computer networks such as the Internet will enable them to have a direct influence on politics, and even to bypass institutional politics or replace it with their own political relations. While the first two views, intending to strengthen institutional politics are mainly supported by politicians and administrators, these alternative views are defended by many social organizations and intellectuals.

The most radical view concerning existing political practice is *plebiscitary democracy*. According to this view, political decisions have to be made through referenda or plebiscites. This implies a preference for direct democracy instead of representative democracy. The opportunities offered by computer networks to hold teleolls or telereferenda and to have online discussions have had an immediate appeal to the supporters of this view. Some use this view to realize or explicitly defend a populism in politics. This happens to be very fashionable at the time. Political persons and single issues are very appropriate for plebiscites and forms of direct democracy in choosing leaders and holding referenda.

Another alternative view is *pluralist democracy*. In this view, opinion formation within and between social organizations is emphasized. Democracy is not the will of the majority but that of a constantly changing coalition of minorities. Its most important value is pluralism in social and political discussion and in the media. It is a combination of direct and representative democracy, since representation is exercised not only by politicians but also by societal organizations. Digital media offer numerous opportunities for pluralism in public debates, among them online discussions. Sometimes group decision support systems can

be used. So-called *deliberative democracy* also belongs to this view. It emphasizes discourse in free and open debates.

The fifth view discussed here is *participatory democracy*. Its supporters promote a socialization of politics, encouraging active citizenship. The emphasis lies on the broadest possible opinion formation about political affairs and on a particular combination of direct and representative democracy. Its most important instruments are public debates, public education and citizen participation in general. If the digital media are to play a positive role in enabling these instruments, access for all is vital.

The last view on democracy has appeared as a dominant model among the pioneers of the Internet community. The *libertarian view* is close to the pluralist and plebiscitarian views in several respects, as the opportunities for (virtual) community building, telepolling and online debates are proclaimed. Specific to libertarianism is the emphasis on autonomous politics by citizens in their own associations using the horizontal communication capabilities of computer networks in general and the Internet in particular. Favourite e-Participation applications are e-activism, online petitions, telepolls and online fora. This view favours so-called Web 2.0 tools.

2.2.4 The background: changing scale and nature of government

Another background for the rise of particular forms of e-Participation is the changing scale and nature of contemporary government. ICTs support both scale extensions and scale reductions of government operations and citizens' interests. At the one side scale is extended in the rise of globalization and regionalization (e.g. Europe); at the other side scale is reduced by the growing importance of local communities. The result is that the traditional scale levels of the nation state and municipalities are under pressure. The nation state transfers tasks to higher and lower (regional) levels while municipalities move tasks to both regions and local communities. Offering a global infrastructure ICTs are able to link all these levels. However, the pressure comes from society as many modernization theories claim highlighting the combination of globalization and localization².

In this report we will see that E-participation is practiced at all levels. In Europe there is growing attention for e-Participation at the European and local community level, be it to a different extent with particular applications (see Figure 5 in Section 4). Remarkably, e-Participation applications are still offered at one particular level and rarely between levels.

The opportunities of e-Participation also are considerably determined by the changing nature of government in contemporary democracies. Many characterizations for this are offered in the literature. It is impossible to go into detail here but we will refer to the following trends in the changing nature of governments: 1. the rise of network government, 2. government as facilitator, 3. governments that increasingly (have to) communicate with civil society and 4. shifting role relationships between governments and citizens.

1. The *perspective of network(ed) government* is described by several political theorists³. It is a combination of government enacted by internal networks (so-called joint-up government) and government executed in external networks with citizens and companies (online public services). A long-term perspective is government as a fully integrated organism of networks that works as a single unit and with one stop service delivery at all scale levels. In the short term government is already linking with the networks of citizens and companies via the Internet in online public services. E-participation comes in via this way: the opportunities of e-Democracy and e-public services on the Internet (the 'front offices'). However, it appeals to have an influence on policy and decision making in government itself, which means joint-up government (the 'back offices'). So far, this

² A.o. Barber (1996), Giddens (1991) and Sassen (1998)

³ For example Goldsmith & Eggers (2004), Kamarck (2007), van Dijk & Winters (2009)

appeal has not been realized as we will show in this report. Network government is still in its infancy.

2. Traditionally governments are regulators, maintainers of the law and care-takers. However, the rise of a self-service society, strongly enabled by the Internet, and the rise of individualized participation and informed citizenship – see above- , supported by web 2.0 applications calls for a government that is not only a (top-down) regulator and care-taker, but also a *facilitator* enabling a more equal relationship between governments and citizens. Obviously, this is also the basis for e-Participation.
3. Increasingly governments will have to be *communicators* with civil society. This is not only necessary to rebuild trust in government among citizens but also because civil society itself is ever more engaged in online social networking and deliberation. Both e-Government and e-Participation will have to be practiced to realize this communicator role of governments. The current style of e-Government is rather instrumentalist⁴. It tries to mimic successful e-Commerce. It is supply-side oriented and measures its success on the quantity and technical advance of online public services offered⁵. A growing demand-side or user orientation can lead to more communication with citizens as clients of online public services and e-Participation can lead to more communication of governments with citizens as citoyens. According to Botterman et al. (2009) this communication can offer more
 - responsiveness to user needs and wants by empowering citizens;
 - open, participative and democratic governments;
 - new forms of evaluating and improving government performance (Botterman & Miljard, 2009).
4. Together with this growth in communication *the roles* of governments (or their civil servants) and citizens are changing. The oldest role label is that of taxpayer versus maintainer of the law, stimulator of the economy and provider of infrastructure and services. A more recent one is the shift to citizen as customer versus government as supplier of services (notably in online service provision). However, the latest role relationship is or should be that of citizens as participants versus governments as communicators and facilitators. E-Participation is one of the activities to support this epochal shift in the nature of government.

2.2.5 Background: rights and responsibilities for governments and citizens

The rights and responsibilities of both governments and citizens in e-Participation are not yet established (see Miljard, 2008). We will see that this indistinctness causes many problems for e-Participation projects. Citizens should know what they can expect as an investment and a result of practices of e-Participation. Governments have to know what they can ask and expect from citizens. In formal representative democracy the rights and duties of political representatives, civil servants and citizens are rather simple and clear. Governors, representatives and civil servants are accountable to citizens for their policies. Citizens have the right, and sometimes even the duty to vote and they should give information and pay taxes to governments when decided by representatives. A decisive characteristic, both opportunity and risk of e-Participation is that it uses tools of direct democracy in a representative democratic system. This causes imbalances in the system. Governors and civil servants often do not know how to respond to practices and results of e-Participation (see the impact analysis in Section 4). Most citizens think that these opportunities of participation simply are an extension of rights, forgetting that they, as stakeholders, also have the duty to, for instance give adequate and correct information, to not disturb

⁴ See a.o. Chadwick (2006)

⁵ See a.o. Bekkers & Homburg (2007)

discussions with improper behavior and to not manipulate the application concerned by means of fraud.

Many applications of e-Participation to be described in the next section, such as online petitions, plan consultations, referenda and citizen control sites reveal a tenor of direct democracy as they are means to participate in public policy outside regular election times. They are a consequence of the desire to engage citizens continually in the facilitator and communicator role of government discussed above. However, most governors and civil servants do not know how to deal with the results while the expectations of participating citizens might have been raised very high..

As we will see, the most basic problem of e-Participation in representative systems is how to integrate the direct democratic input of e-Participation tools in this system. Without supporting the simplistic ideas of an Athenian agora in a modern, extremely complex society, it must be acknowledged that both the epochal social trends discussed above and the technological opportunities of ICT reinforce the rise of direct-democratic input into the representative system. Inevitably, rights, responsibilities and accountabilities of both governments and citizens will have to be redefined for effective e-Participation that matches the expectations of all stakeholders.

2.2.6 Background: openness versus privacy and security

The conflict between representative and direct democracy also appears in the opposition between the norms of openness versus confidentiality, privacy and security in e-Participation. The stereotype is that representative democracy uses secrecy and 'back-room policies' while direct democracy offers open opinion formation and decision making in petitions, debates peer-to-peer networking and referenda. Reality is far more complex. In the phases of decision making and policy execution any representative system needs time for deliberation, consideration and negotiation. This always takes some time and on some occasions a partial withdrawal from publicity. Moreover, the temporary confidentiality of negotiations is a legitimate instrument for successful consultation. Opposed to this the reality of direct democratic instruments often is less open than suggested. Petitions and referenda can be liable to hidden manipulation, debates in fact are often secluded from publicity and inclusion for all. Finally, peer-to-peer or other networking can be obscure and unaccountable to all outsiders.

Another realistic counterpart of openness in e-Participation is the legitimate privacy and security concern of all stakeholders. Petitions should be open in a free and democratic society, but votes will have to be private and secure when using ICT tools. This also goes for the use of voting guides. Suppliers of these guides have been accused of storing the IP addresses of users. So-called 'snitching sites', of citizens reporting crimes and offenses should be anonymous.

More in general, it must be claimed that most applications of e-Participation to be described in the next section should enable privacy options for users. This is not only a matter of principle but also of practice. As we will see the Achilles heel of e-Participation is the lack of trust of stakeholders in each other: citizens in governments and politicians or civil servants in citizens. A lack of privacy options will simply result in less participation by all parties. We will see that openness, transparency and accountability, important norms of e-Participation are ideal(istic) notions that meet many limitations in practice.

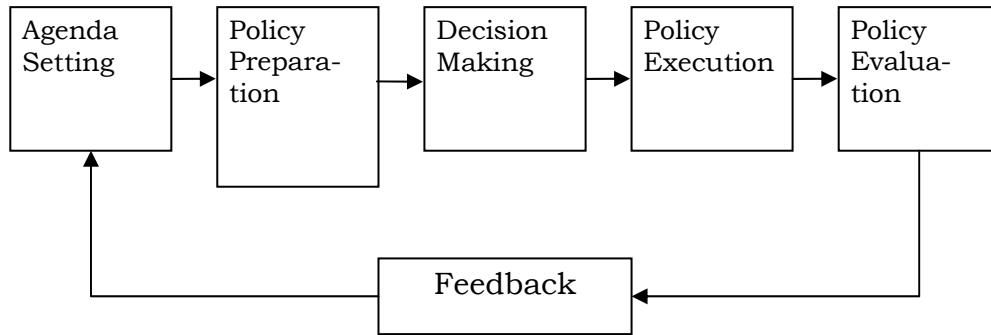
Finally, it must be stated that the (ICT) security of instruments of e-Participation is vital as most of them otherwise would be susceptible for manipulation and fraud.

3 Applications of ICT in the domain

3.1 Introduction

In this report the various kinds of applications of e-Participation are classified and analysed according to generally accepted phases of the policy process in general. This is a cycle that consists of the following phases:

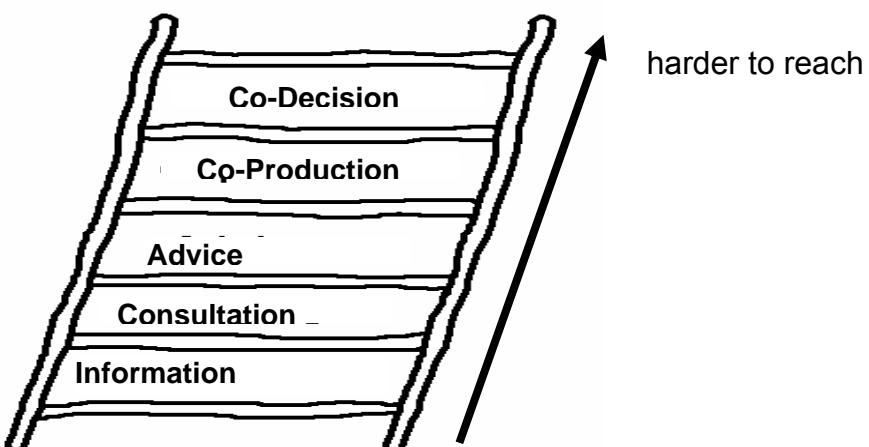
Figure 2: Phases in the Policy Process



Currently, most experience in e-Participation has been reached in the phases of agenda setting, policy preparation and policy evaluation. Applying e-Participation in decision making and policy execution is contested. The views of democracy that strongly emphasize representation and representative democracy, the legalist and competitive views have doubts about directly engaging citizens in decision making and policy execution. These phases are supposed to be reserved for political representatives and public administrations executing the decisions of governments and parliaments. Here the only option for them would be e-voting in systems of representation.

This is related to the *nature* of activities in e-Participation. The so-called participation ladder – see Figure 3 - arranges these activities in the order of a number of steps that are increasingly difficult to take. All views of democracy and participation support open and accessible information exchange between governments, public administrations and citizens in the policy process. Citizen consultation is also supported by all, but the representative views do not want that obligations for governments are derived from the consultation results. Seriously accepting citizen advice is even harder to accept for the strict representative democracy views. Finally, co-production by citizens and governors of government policy and public service (design and execution) is accepted by some views of democracy but not by others. Co-decision is even more contested. Actually only the plebiscitarian and libertarian views of (direct) democracy – see above- support this opportunity of e-Participation.

Figure 3: The Participation Ladder and the Nature of Activities in e-Participation



In this section thirteen applications of e-Participation will be described and analysed (advantages and disadvantages). The list comes close to the list of eleven participation areas defined by Demo-Net in 2006.⁶ The main differences are that the list in this report describes applications and inserts them in the framework of the policy phases and the distinction of government-centric and citizen-centric initiatives of eParticipation. In every phase of the policy process both the applications initiated by governments or public administrations and by citizens will be listed.

3.2 Agenda setting

1. Open Online Consultations (governments and public administrations)

Governments sometimes not only inform citizens about their policies on government websites, but also invite citizens to reply or to have an input with their own ideas, suggestions or complaints. Information provision is the most frequently used application in e-Participation (see Figure 4 below). Only, information provision is not sufficient to talk about participation. At least an invitation to react to the information supplied should be added.

Public administrations more often ask for complaints and suggestions about their public services to improve quality and develop new services often asked for. Some governments explore the Internet to seek for weblogs, online discussions and actions in order to know what the mood is among citizens.

Although information exchange without participation is no part of e-Participation the quality, accessibility and usability of the information provided for consultation appears to be decisive for its success. Another vital issue is trust: some citizens are rather cynical in their belief that governments and public administrations will not perceive or act on their input to open consultations (see Figures 7 and 8 below).

2. E-petitions and E-activism (citizens)

In many EU member states, notably the UK, citizens initiate or use e-petitions to put single issues, complaints, or requests on the political or government agenda. In Scotland this has become an official initiative of parliament (citizens are invited to fill petition lists on a website)⁷. E-petitions can become very important tools in those countries where there is a legal right to put issues on the agenda of parliament after having collected a particular large

⁶ List from DEMO-net (2006):

- **Information Provision.** ICT to structure, represent and manage information in participation contexts.
- **Community Building /Collaborative Environments.** ICT to support individuals coming together to form communities, to progress shared agendas and to shape and empower such communities.
- **Consultation.** ICT in official initiatives by public or private agencies to allow stakeholders to contribute their opinion, either privately or publicly, on specific issues.
- **Campaigning.** ICT in protest, lobbying, petitioning and other forms of collective action (except of election campaigns covered under electioneering area).
- **Electioneering.** ICT to support politicians, political parties and lobbyists in the context of election campaigns.
- **Deliberation.** ICT to support virtual, small and large-group discussions, allowing reflection and consideration of issues. In our survey deliberation also includes discussion and consideration of issues in an unstructured and non-moderated manner.
- **Discourse.** ICT to support analysis and representation of discourse. In our survey discourse differentiates from deliberation in that it covers conversation and dialogue between citizens and elected representatives.
- **Mediation.** ICT to resolve disputes or conflicts in an online context.
- **Spatial planning.** ICT in urban planning and environmental assessment.
- **Polling.** ICT to measure public opinion and sentiment.
- **Voting.** ICT in the context of public voting in elections, referenda or local plebiscites.

⁷ <http://www.scottish.parliament.uk/business/petitions/open/index.htm>

number of signatures. The Internet is a much more powerful tool to reach this goal than traditional means of signature collection. Recently, such a petition had an impact on decision making in the UK. The Brown government withdrew a plan for road pricing after a petition against it reached mass support.

The Internet is also used on a massive scale for E-activism. Numerous groups launch websites to promote their special interests and viewpoints appealing not only to fellow citizens but also to governments and politicians. These voices generally are autonomous and not influenced by governors or politicians. However, it is rarely clear whether these activists only speak for themselves or for a particular part of the citizenry. The communication style of E-activism is to express and to try to convince and influence the opinions of others and not to discuss own opinions.

3.3 Policy Preparation

3. Online Plan Consultations (Governments)

During the years of the Internet hype many European governments launched official online consultations of citizens to discuss government plans that were already prepared. The intention was to engage more citizens in the process of plan making than only those citizens that were known as more or less professional lobbyists gathered on official meetings. This application has been used by national ministries discussing new policy documents and by local governments presenting zoning and building plans for particular neighborhoods. Even municipal budgets have been proposed to local citizens to inform them and to consult them about priorities of expenditure and savings⁸. In general the results were disappointing as the same kind of lobbyists showed up as before and because governments did not accept results as they were deemed to be not representative.

In the current stage of Internet diffusion and technological development the opportunities for online plan consultations increase because more citizens are able to participate and because a number of innovations in plan consultations are introduced (see a.o. Botterman et al., 2009).

First, plans can be visualized better. This substantially increases the potential of online plan consultations among everybody, but in particular for less educated people in terms of literacy. For example, citizens can see and choose between visual models of particular street or neighborhood plans or explore Second-Life-like environments of their future district (see a.o. Aichholzer & Westholm, 2009).

Second, with visualization and aided by computer simulation policies can be modeled and different optional trajectories of plans can be simulated for a large part of the population. Third, (serious) gaming with all kinds of plan options can make the participation in online plan consultations much more attractive for younger citizens in particular. A fourth innovation consists of tools to analyze the textual contents of feedback on plan consultations and online forums (the next application to be discussed). They are so-called *semantic web* applications and *Web 3.0 tools* (intelligence used to extract meaning from web sources). With the exception of visualizations these innovations still are in an experimental stage and only explored by higher educated professionals. Their social impact and potential cannot be assessed at this moment.

⁸ For example in the German city Esslingen in 2003. Ultimately, this project was not successful: quantitative and qualitative participation of inhabitants was reasonable (about 150), but results were not accepted by the local public administration, among others because the municipal council did not want to lose power over financial decisions (see Roeder et al., 2005).

4. Online Forums for Policy Making (Citizens)

Since the advent of Usenet groups more than twenty years ago Internet users have discussed all kinds of societal issues in online forums. They offer the opportunity of contributing to discussions 24 hours a day and from every location without the necessity to meet. All contributions can be made simultaneously. Usually there is no limit to the number and length of contributions. Many online forums are dedicated to political and policy issues. About every important issue stirs some kind of discussion on the Internet. Sometimes, they are linked to E-activism.

Evidence shows that online forums do not draw more people into these discussions than in traditional meetings discussing policy or political issues, with the important exception of a part of the young generation⁹. Rarely, they are representative for particular populations as they are dominated by well-educated middle-aged men (a.o. Ter Hedde & Svensson, 2009). Somehow online discussions appear to be less attractive for females than for males (Ter Hedde et al., 1999). Moreover, discussion is not equalized as most online forums are dominated by a small core of contributors (Ter Hedde et al., 2000). Most participants only read the contributions of others and do not contribute themselves. Finally, it must be acknowledged that these forums have no, or only a small effect on opinion formation and decision taking in institutional politics, even less than the official plan consultations discussed above¹⁰. Governors complain about the lack of representativeness. However, as these forums are so popular with many thousands of participants in every country, they must have some effect on the consciousness and knowledge of policy issues among citizens (van Dijk, 2006).

Deliberating online groups have some important disadvantages that should be corrected by moderation, discussion rules and the filtering of contributions marked by scolding, insults and flaming to make these collectives effective (Sunstein, 2008)¹¹.

- *Amplifying errors*: bias in groups tends to be not reduced but extended; escalation to a course of action that is failing can often be observed;
- *Common knowledge effect*: information and views held by all group members have far more influence than minority or individual information/views (that tend to remain silent);
- *Cascades*: following the lead of others people go along with the crowd to maintain a good opinion of others though they know better (they also remain silent)
- *Polarization*: deliberating groups turn individual initial different views more extreme instead of coming together.

Another condition is the organization of an equal playing field for discussion. When the weblog of a particular person or the website of a particular pressure group launches the discussion, postings often will simply be used for propaganda or advertisement. For example on the very popular weblog of the Italian comedian Beppe Grillo, that also acts as a politician Grillo himself is the central actor in a ‘discussion’ with his readers following a star structure. Grillo introduces his statements and readers respond with all kinds of postings that are published without any filter. In such a structure rarely a discussion or discussion thread appears among the readers themselves.

The last problem in online discussions to be mentioned is the low level of interactivity and of drawing of conclusions. Discussion threads on average are very short: someone makes an

⁹ A.o Katz & Rice (2002) and Delli Carpini & Keeter (2003).

¹⁰ See note 16.

¹¹ A host of social-psychological publications exist that testify to the special group dynamic effects in computer-mediated communication and online discussion groups. Some of them support the discussion quality of online groups and others harm it.

argument and others reply, than most discussions stop¹². As compared to physical meetings there is no social-psychological drive for consensus and to come to a conclusion in online discussions¹³. Again, this shows how important moderation is as a means to stimulate and organize online discussions.

5. Online Knowledge Communities and Social Media serving Policy Making (Citizens)

Online forums already exist since the famous Usenet groups of the 1980s and 1990s. Online or virtual communities drew a lot of attention in the 1990s. Since that time they have evolved both in depth and in breadth. Online forums have deepened into knowledge communities of professionals. Virtual communities of special interests have become more popular with the rise of so-called ‘social and participatory media’ or ‘social computing’ that are fed by user-generated content. Currently, social networking sites are used by a majority of European Internet users¹⁴. Their prime focus is the maintenance of social relationships and entertainment. Next to them we can observe the rise of weblogs for information and news, wiki’s or wikipedia’s for knowledge building, YouTube and others for the exchange of creative content and virtual communities such as Second Life and game sites for social exchange, identity formation and play. Usually, they do not engage with the sphere of official public policy making. Exceptions are political weblogs and online health support groups of patients. Another exception are citizens’ watchdog communities such as WikiLeaks¹⁵ that we rubricate under Citizen control sites (below).

Serving public policy making these applications are still in an experimental stage and mainly practiced by the early innovators and professionals of ‘serious’ social computing. However, in theory and practice online knowledge communities and social media can support issue based political involvement of activists and interest groups. “People are able to find each other around very specific subjects and to spontaneously organize an advocacy group” (Huijboom et al., 2009). They can exchange content in networks with a predominant social character and gather knowledge that gives them more influence on society and on government. In so-called ‘crowd sourcing’ the presumed mass-collaborating tools of Web 2.0 afford the compilation, structuration and dissemination of public sector information in order to make government more transparent and public officials accountable.

The experimental stage of these applications makes a social impact analysis rather difficult. Their main problem seems to be inclusion. Unlike the related online health support groups and citizen control sites that are popular among many social categories, social media and knowledge networks for ‘serious’ applications are mainly used by people with high education. After all, they require a fairly high level of digital skills, and when applied to the public sector knowledge of government affairs. Other problems are the reliability of user-generated content and the potential of manipulation (*ibid.*, p. 116). When they use discussion formats, f.i. in crowd sourcing all the opportunities and risks of online debates discussed in the previous paragraph appear.

The growing popularity of social networking sites has attracted governments, civil servants politicians to see whether they can reach them with their messages. The Barack Obama campaign has used the social media to draw attention, support and volunteers. Governments and civil servants worldwide try to ‘infiltrate’ these networks and other social media for the benefit of public information campaigns, to learn about moods and interests among the population at large or simply to survey and censor them (e.g. China).

¹² A.o. Ter Hedde & Svensson (2009), Jankowski & van Selm (2000) and Rojo & Ragsdale (2003)

¹³ Attempt of social-psychological explanation is made in van Dijk (2006, p. 229-232).

¹⁴ According to Technorati (2009), a search engine for the ‘blogosphere’: <http://www.technorati.com/>

¹⁵ WikiLeaks (www.wikileaks.org) publishes and comments on leaked documents alleging government and corporate misconduct

3.4 Decision Making

6. E-voting (governments; election committees)

ICT offers new channels for voting both in elections and in referenda or official opinion polls. A distinction should be made between electronic machine voting and electronic distance voting. The last kind of e-voting is discussed here. It offers new opportunities for people who live far from a polling station, have a lack of time or are handicapped. However, most evidence in the few instances where online e-voting is already practiced – mainly among expats- shows that these opportunities do not, or only scarcely result in a higher voter turnout. Most experience has Estonia where Internet voting for all voters has been applied in local (2005) and national (2007) elections using the available general ID cards. In the (nationwide) local elections 9.317 persons (or 1% of the electorate) voted via the Internet and in the national elections 30.275 (about 5%)¹⁶. So, the number is rising and it is to be expected that E-voting will be an important *additional* channel in future elections. However, a number of basic problems have to be solved to turn e-voting into a generally accepted channel. Discussion concentrates on technical issues (mainly identification, privacy, security and fraud) and on the accessibility and usability of the channel for all. However, basic social and political problems might be more difficult to solve. They are:

- The secrecy of the vote

As opposed to the secret ballot others are frequently able to view citizens voting at their own terminals.

- Opportunity of free individual voting without the interference of others.

E-voting is liable to direct social pressure of partners, parents and others influencing the individual vote in private situations.

- Exclusion of election propaganda near the e-voting application

As opposed to the ban on propaganda inside or in front of polling stations propaganda in settings of E-voting could be just one click away: a link to a party website or the next on the favourites list.

So, outdoor electronic or traditional polling stations should be kept available for all.

7. E-campaigning (citizens and politicians)

The Barack Obama campaign has shown how important E-campaigning can become for elections. With his Internet applications he gathered more than 500 million dollars of funds and organized an army of campaign volunteers as participants in his campaign. E-mail, YouTube, social networking sites and an extended own website were very frequently used. This electoral technology will somehow move to Europe as well.

Citizens themselves can also use E-campaign means to put a pressure on governments. This also happens outside election times. On the Internet we have thousands of European pressure groups trying to influence government decision making.

However, currently the most important applications of E-campaigning for citizens themselves are *E-voting guides* that are very popular in several European countries. They are decision-support systems offered by more or less independent public policy and research institutes helping voters to choose the best party, candidate or referendum option on the basis of a number of positions and statements. Their result is a particular advice to vote. Their

¹⁶ See English Wikipedia: http://en.wikipedia.org/wiki/Electronic_voting_in_Estonia#cite_note-5 (retrieved on 7-5-2009)

popularity in a large number of European countries rises so fast¹⁷ that perhaps they can be called the most important contemporary tool of e-Participation. These guides have a number of opportunities and risks:

Opportunities are:

- Assistance in decisions to vote a party or candidate for those who are insufficiently informed
- Assisting those who have a lack of time or motivation to easily get familiar with current election issues
- Turning voters to substantial issues, instead of political images or persons as voting guides are based on programmatic issues

Risks are:

- Partiality: the design and composition of the guide can lead users more in one than in the other direction¹⁸. How independent are the suppliers?
- Manipulation: guides may lead the users in a direction they don't want: (surprising result). For example, they want a choice based on ideology or persons, but get a completely issues based choice. The methodology of the guides is not clear to many users.
- Simplification of political issues: in most guides simple yes/no choices have to be made for single issues without coherence
- Incompleteness: with many competing candidates or parties often not all of them are in the guides. Those that are included, have no say in the choice of items that has been made from their programmes.
- Lack of access: though very popular the guides are mainly used by those already going to vote, those that are more politically involved and relatively high educated.

3.5 Policy Execution

8. e-Maintenance of the Law (by citizens invited by governments)

Of course governments use ICT systems extensively to control for criminality and offenses of rules and regulations themselves. However, the government can use additional eyes to survey what happens in society. This certainly is a kind of participation in policy execution. We are talking about municipal and police sites on which citizens are able to report all kinds of offenses, from child pornography to having seen someone driving a car using a mobile phone that is not hands-free. These *snitching* sites are increasingly popular among the population. They can also turn against governments as they can also be used to report offenses by civil servants and to launch complaints against government acts (see below).

¹⁷ For example: in the German general election of 2005 more than 5 million Germans used this tool. In the Netherlands, one of the first countries using Electronic Voting Guides, since the 1990s, in the general election of 2006 4,7 million potential voters used the so-called *Stemwijzer.nl*, that is about 2/3d of the electorate. In a representative survey of the University of Tilburg 42% of respondents declared this tool was helpful to them in deciding their vote, 27% responded that it influenced their party preference and 15% answered that it changed their original intended vote (see Boogerman, 2006).

¹⁸ For example: At the time of the Dutch referendum on the European Constitution (2006) there were several competing guides. Filling in the guide of the opponents to the Constitution 'inevitably' led to the choice NO, while the most popular guide (*Stemwijzer.nl*) was accused of being in favour of the constitution.

9. e-Government services following the needs of citizens and including participation (government initiative)

The provision of e-Government services is still marked by a strong supply-side orientation. The goal is to provide as many public services online as possible and to offer them in the most advanced shapes, including full electronic transactions. However, it appears that there is scarcely any correlation between the supply of these services and the demand by citizens that lags far behind. For example, in 2009 Austria has an availability of 100% of government services for the public while only 39% of Austrians have used the Internet in the last 3 months for interaction with public authorities (Eurostat 2009) – A 2008 study for the European Commission revealed that usage of e-Government services in Europe was only about half of the services supplied¹⁹. And the 2009 eGovernment Benchmark also highlighted a usage of services lagging behind²⁰. Online public services can offer major improvements for European citizens but we have to admit that many still prefer traditional channels and that online services often increase the use of call centers and the like because the Internet services often are not sufficiently user-friendly or interactive. A multi-channel strategy is required (van Dijk et al. 2008, Ebbers et al. 2008).

The main solution to this mismatch of supply and demand is the systematic registration of user needs, competencies (skills) and behavior. This is common practice in the corporate sector, but unfortunately not in the public sector. Citizens' needs and behavior in using online government services have to be continually monitored and *demand side* benchmarks have to be developed. This is a general way to offer citizens more participation in the practice of e-Government services.

A second solution is to link democratic participation to service provision. Usually e-Government mimics a rather narrow type of e-commerce. However, government services often can be linked to opportunities for citizen input and for more 'political' uses. For example, governments can offer simple online schemes to request garbage collection at a particular address and time. But they also could extend these services with venues for complaints and suggestions of improvement concerning environmental and dirt issues in the neighborhood concerned. This is an important new kind of participation in governmental affairs that has to be explored.

10. e-Government services with participatory user-design (government initiative)

Some electronic governments do invite citizen input in designing and improving online public services in advance, not the use of it afterwards. This is called user-centred service design. This is quite a step to take for the traditionally supply-oriented online and offline government public service provision. It is a part of the start of a demand-side shift that is made by some European governments under the influence of the opportunities of ICTs.

11. E-complaints and e-surveillance (initiated by citizens)

Citizens themselves are also able to launch sites for complaints against wrong or badly executed government policy. This happens on the fields of social and public services, the execution of for instance environmental, juridical, mobility and minority or immigration policies and even cases of corruption. Here it appears that these opportunities of e-Participation can be a two-edged sword as the same technology can be used to undermine government policies and regulations. For example, sites are available that warn drivers for the exact places where speed cameras along the road are installed.

¹⁹ See in European Commission, Information Society and Media DG (2008a, p. 124) Figure 18 for a comparison of supply and demand

²⁰ See European Commission, Information Society and Media DG (2008b)

3.6 Policy Evaluation

A fast growing number of applications are available for policy evaluation both on the initiative of governments and citizens. Along with the applications of agenda setting and policy preparation they are most frequently used.

12. Quality panels and individual evaluations of online public services (government initiative)

Some governments, mainly on the local level have installed online quality panels or individual feedback systems in their online public service supply. This enables citizens to rate the level of service provision and to return suggestions. For governments this gives the opportunity to improve services continually. Notice that this application is the registration of citizen *opinions*, not citizen usage *behaviour* as called for above (under 9).

13. Citizen control sites and information services for public or government policy (citizen initiative)

The fastest growing applications of e-Participation are all kinds of control sites and information services for citizens that enable them to evaluate official policy results on a daily basis *and to use them for their own decisions* in daily life, such as the choice of a place to live. The issues concerned are not as political as the familiar policy debates on the Internet and other mass media. However, they prove to be very attractive to average citizens, also those with no political motivation. Examples of these control sites are sites where local residents are able to report the level of noise around airports and the pollution of particular regions or waters. Extremely popular are *social geographical cards* of quarters and neighbourhoods reporting their statistics of criminality, housing prices and living quality. Citizens frequently use them in their decision to buy a house somewhere. Strikingly, these services usually are private initiatives of small Internet companies that process publicly available data from governments in a far more efficient and usable way than governments themselves apparently are able to do.

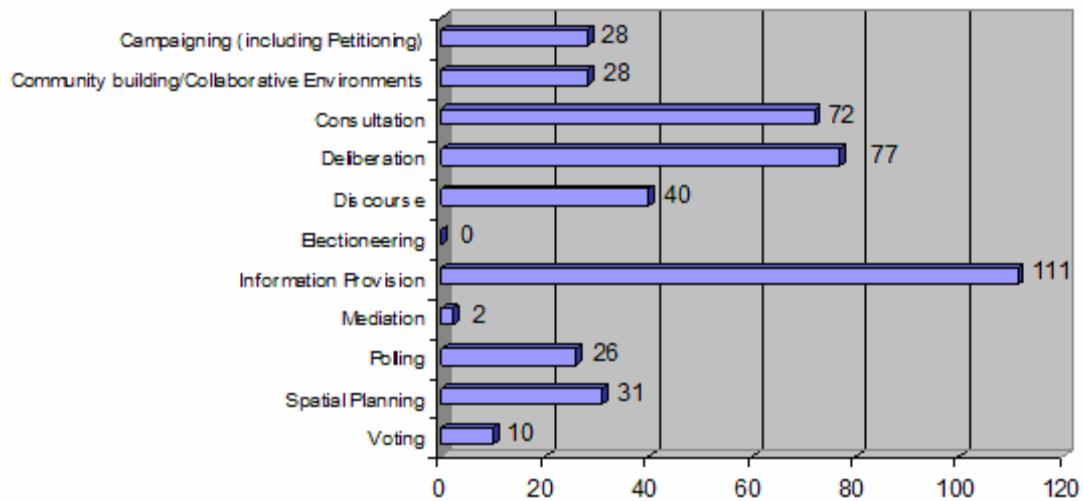
3.7 Usage Frequencies of e-Participation applications in Europe

In 2008 Greek investigators Panopoulou, Tanbouris and Tarabanis have made an inventory of current e-Participation activities across Europe (Panopoulou et al., 2009). They detected and analysed 255 e-Participation initiatives from 18 different countries and 34 languages in online databases, award schemes, literature research and communication with experts and project owners. The number is not complete and perhaps not representative as only projects with (at least) English or German summaries were selected. The sample contained both finished and running projects. The projects were analysed along the scheme of e-Participation areas devised by DEMO-Net²¹.

²¹ See note 6

The following frequency of areas of the 255 e-Participation applications were found (overlap was allowed).

Figure 4: Distribution of application areas in 255 European e-Participation projects (selected in 2008)

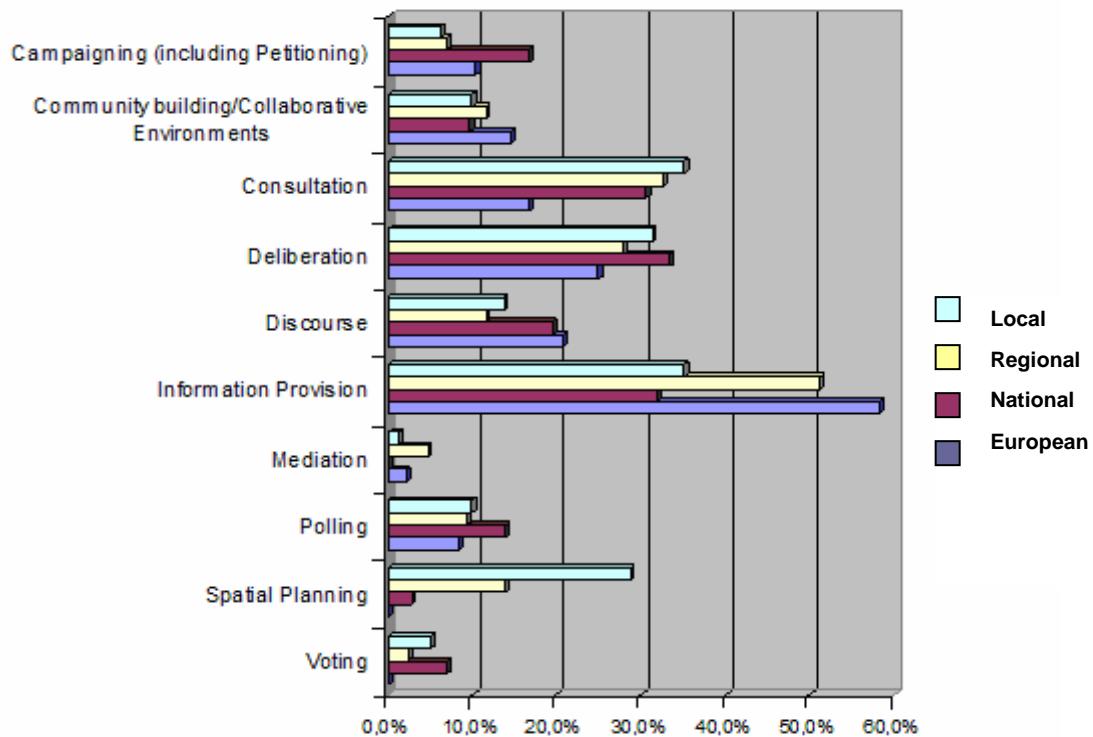


Source: Panopoulou et al. (2009)

Information provision, consultation and deliberation appear to be the most important application areas. Information provision mainly corresponds with our application 1: open online consultations (asking for feedback on government information sites). Consultation primarily matches 3: online plan consultations. Deliberation equals 2: e-petitions and e-activism, 4: online forums and 5. social media. This testifies to the fact that e-Participation currently concentrates on the first phases of the policy process: agenda setting and policy preparation. Decision making and policy evaluation are not in focus. Policy execution is not contained in the areas distinguished by DEMO-net.

When we compare the application areas on the local, regional, national and European levels we can observe that consultation in general and consultation on spatial planning in particular mainly are a local affair while information provision is the most important application at the European level. Polling is most used at the national level. See Figure 5 below.

Figure 5: Distribution of application areas across geographical levels in 255 European e-Participation projects (selected in 2008)



Source: Panopoulou et al. (2009)

Though the use of e-Government services lags behind supply – see above- e-Government generally is more successful than e-Participation. Though in the year 2008, 39,4 percent of the EU Internet users has never used e-Government services and 14,8 percent no e-Government information, applications of e-Participation have never been used by 58,1 percent of European Internet users. See Table 1 below. Further it appears from this Table that e-Participation is practiced by a small minority of Internet users. A number of 9,6 percent uses the applications concerned only once a month, but not a week, 3,8 percent once a week and 1,8 percent once a day. So, even when civilian organizations and NGO's are regularly using ICTs for their daily work of organizing, lobbying and campaigning, citizens at the individual level are still barely participating by means of more or less official applications of e-Participation.

Table 1: Use of eParticipation in the EU as compared to use of eGovernment information and services in 2008

	Not once in the past 12 months	At least once, but not every month	At least once a month, but not every week	At least once a week, but not every day	Every day or almost every day	Total (N=10.000)
eCommerce	8,9%	41,4%	35,5%	11,7%	2,5%	100,0%
eBanking	15,1%	5,8%	20,8%	37,1%	21,2%	100,0%
eGovernment information	14,8%	45,7%	25,0%	10,0%	4,6%	100,0%
eGovernment services	39,4%	46,6%	10,2%	2,7%	1,1%	100,0%
eParticipation	58,1%	26,8%	9,6%	3,8%	1,8%	100,0%
Social Networking	43,5%	13,8%	12,0%	13,7%	17,0%	100,0%

Source: European Commission, Information Society and Media DG (2009)

4 Social impact analysis

After having described the various applications of e-Participation together with their opportunities and risks, we are able to make an impact analysis of these applications on the domain of participation in policy making. This is the ultimate goal of this report, of course. Unfortunately we can only give a provisional impact analysis. The main reason is that current and past e-Participation research in the last 10 to 15 years has delivered inconclusive evidence. So we will first have to make a short description of the state of the art of e-Participation research, both scientific and policy oriented.

According to a 2006 survey of who was doing what in European e-Participation research Macintosh et al. (2005) found the considerable number of 76 research groups from 20 European countries responding to the survey. Most research came from the UK, Italy and Germany. The emphasis was on online deliberation and consultation projects. In general, a lack of research on technology assessment and impact assessment was observed (Macintosh, 2008).

What are the reasons for the lack of conclusive results of such a large number of investigators? The first reason is that a general evaluation framework of e-Participation projects was missing until fairly recently as we will discuss below. The reason for this comes from theory and practice. In theory scientists do not agree on the definition of e-Participation. Some definitions are much broader than others (the one in this report is fairly broad). In practice, concrete e-Participation projects rarely make their goals and expectations explicit and this makes a systematic evaluation rather difficult.

Some observers mention more basic reasons. Medaglia (2007) observes a dominance of descriptive approaches and a lack of theoretically grounded contributions. A general observation is that e-Participation research is very fragmentary and case-oriented. Sanford and Rose (2007) conclude in their overview that motivations for e-Participation research are rather different and that coherence is missing. They have distinguished three perspectives:

1. The participative imperative: the desire to understand, improve or reshape societal participation forms. This is a democratic motivation with a strong ideological or normative drive.
2. An instrumental justification: e-Participation applications are investigated as instruments for improved public policy and the implementation of services.
3. A technology focus: many researchers study the role of technology, sometimes with a view to improve it.

The first motivation can make researchers a bit blind for empirical impact analysis. The second and the third focus on e-Participation tools might lead to the idea of a technological fix for problems of participation and engagement that in fact go much deeper. Instrumental and technological research only is not sufficient to draw conclusions for a substantial policy impact analysis.

Currently a large number of Ph.D. theses are prepared in the field of e-Participation²². We will have to wait and see whether they produce more conclusive results.

In this situation this report is only able to make a **provisional impact analysis** drawn from the available literature discussed in the broad framework of policy phases for e-Participation presented here. We will make this analysis by following the themes from the Conceptual Framework that are also used in the other domain reports.

²² See a collection of some of them in Avdic et al. (2007)

With the theme *rationalization* we will discuss the effectiveness and efficiency of the e-Participation applications described in terms of more or less explicit goals. Additionally, we will pay attention to the goals of better informed policies, faster policy making, transparency and openness.

Under the theme *networking* the opportunities and threats of direct (peer-to-peer) networking between citizens (or members of institutions) and between citizens and policy makers will be listed.

The theme *empowerment and participation* deals with the impact of e-Participation applications on the actual participation of citizens and members in the policy making process. Are these applications used more and in other ways than older venues of participation? What is the social background of those engaged?

Though the theme *social capital building* is the focus of another domain report the potential contribution of e-Participation applications to community and social relationships building among citizens might be an effect that is just as important than the influence on policy making in the institutional or political domain.

The last theme will be *information and lifelong learning*. Continuous information exchange between citizens or members and policy makers is the core activity of most applications of e-Participation. Even when these applications would be less effective in terms of contributions to policy or decision making, they could still be very instructive to the participants themselves, both citizens and governors. Continuous citizenship and membership training can be very important additional goals of e-Participation.

4.1 Rationalization

What are the effectiveness and efficiency of these applications of e-Participation ? The answer clearly depends on the view of democracy one supports. In one view the quantity of participation by citizens is the decisive norm, in another view it is the quality, e.g. the quality of deliberation in online discussion. In again other views it is the influence on decision making by governments that holds. All views support the norm that e-Participation is able to improve the quality of policy making by the exchange of information between citizens and governments in two directions. The quantity and quality of participation and the quality of information in decision making are aspects of rationalization in contemporary society. The millions invested in e-Participation projects are expected to have their returns. These returns should be measurable. For this purpose currently evaluation frameworks for these projects are designed. They should first of all determine the effectiveness and efficiency of e-Participation projects. We will see that this is not an easy task.

4.1.1 Effectiveness and efficiency

The effectiveness and efficiency of applications of e-Participation depends on the goals governments or citizens attach to them, and behind these goals often are different views of democracy. Those supporting better information exchange between policy makers and citizens will look at different goals to be achieved than those attempting more deliberation between the parties concerned or participation in decision making.

According to the literature potential goals of *governments* with e-Participation can be:

- Improving the quality of government policies and services
- Closing the gap perceived to be growing between governments and citizens
- Boosting the legitimacy of government policy (because citizens are consulted)
- Knowing what is going on in society: e-Participation as social antenna
- Insight in the growing social, cultural and opinion diversity in society

- Mobilizing unknown creativity and expertise in society at large, both among professionals and lay people.

The potential goals of *citizens* in e-Participation are:

- Citizens want to put (new, forgotten or neglected) issues on the agenda
- Citizens want more attention to a particular special interest of their own
- Citizens want more information and better services
- Citizens want to discuss particular issues with policy makers
- Citizens want more choice or a larger part of policy decision making
- Citizens want to monitor the execution of government policy that is in their interest
- Citizens want to call attention to particular abuses or criminal acts
- Citizens want to help in solving particular social problems

The biggest problem in evaluating the effectiveness and efficiency of e-Participation applications or projects is that most often they do not state their goals in an explicit way. It is even more unusual to find expected quantitative results in project plans. After the project one rarely settles accounts on the original goals. Background views of democracy are most often not mentioned.

This state of affairs may be understandable and acceptable in a period of experimentation when one is still looking for the possibilities. However, after a time-span of ten to fifteen years of experiments in e-Participation one expects more, at least more explicit project evaluations. After all, the EU, among other levels of governance has spent many millions in these projects in recent Framework Programmes²³.

1. Evaluation Frameworks for e-Participation

Since about five years e-Participation researchers have started to make evaluation frameworks for projects. The most widely accepted is the framework devised by Macintosh & Whyte (2008) in 2008. This has been further elaborated by the European Network of Excellence DEMO-net and by Aichholzer and Westholm (2009)²⁴. This framework contains three perspectives. The first is the project perspective with classical criteria valid for all project evaluations such as goals, mean and results and criteria valid for e-Participation projects such as community development and obtaining better informed opinions. The second perspective is called socio-technical. This deals with the project design and the software and other tools used. Here the acceptability, accessibility, usefulness, and usability of the projects for users have the focus of attention. Finally, the democratic perspective is elaborated. This concentrates on the democratic appeal of e-Participation such as representation, support of engagement, transparency and accountability. See the very detailed complete framework in Annex 1 of this report.

This framework has only started to be used, mostly with a selection of criteria from its complete list. Macintosh and Whyte (2008) have first applied it to four local authority led projects in the context of the UK Local e-Democracy National Project. Aichholzer and Westholm (2009) used it to evaluate the so-called multimedia dialogue approach to e-Participation in three cases: Bremen (Germany), Ale (Sweden) and Zwaagwesteinde (Netherlands). Previously Christine Leitner, one of the authors of the European eGovernment 2005-2007 stock of the i2010 eGovernment Action Plan (Millard, 2007) evaluated a number

²³ According to Panopoulou et al. (2009) the largest part of the origin of funds in the 255 projects in Europe they identified in 2008 were EU funds: 17% of the 40% identified (almost half).

²⁴ See also Lippa et al. (2008)

of e-Participation projects in the UK, Sweden, Estonia and the Netherlands with more general criteria such as challenges and barriers, achievements and impacts.

These kind of empirical evaluations show the way. However, they are still in their infancy and as they are not representative general conclusions cannot be drawn from them. Nevertheless we will use them for our own provisional evaluation in the remainder of this report.

2. National e-Participation Indexes

Another approach of benchmarking e-Participation, this time for countries as a whole is the construction of eParticipation Indexes. The United Nations E-Government Readiness Reports have published such an index in 2005 and 2008.

For the 2008 report an Index is created that is based on a survey of 21 citizens' informative and participatory services and facilities across 189 countries, in instances in which these services and facilities were online and where data was available. The questions posed to the national services and facilities were grouped under three categories: e-information, e-consultation and e-decision-making. Each country was assessed on a scale of 0-4.

a. E-Information

The government website offers information on the list of elected officials, government structure, policies and programmes, points of contact, budget, laws and regulations and other information of public interest. Information is disseminated through a number of online tools such as: community networks, blogs, web forums, text messages (micro democracy), newsgroups and e-mail lists.

b. E-Consultation

The government website provides the tools necessary for e-consultation. It allows citizens to set the agenda for the debate through e-petitioning. The government ensures that its elected officials have a website to communicate directly with their constituents. It maintains an archive of their discussions and provides feedback to citizens.

c. E-Decision-Making

The government is willing to take into account the e-inputs of citizens into the decisionmaking process. The government informs its citizens on what decisions have been taken based on the consultation process.

The resulting indexes should be considered with great care and in a critical way. Some observers even take them with a grain of salt. The index emphasizes the *supply* of services and facilities on government websites. The citizen initiative is absent. Only the provision of feedback to citizens and the information to citizens on what decisions have been taken based on the consultation process refer to citizen input.

Another important characteristic is that these Indexes only measure at the national level and not at the local, regional and international levels. When one, for instance, compares 2008 to 2005 data, the UK fell from the first to the 25th ranking on the e-Participation and was supposed to be equal with Mozambique. This was mainly due to the migration of e-Participation products and services from its national portal to local government portals. See Annex 2 for the Top 35 countries in 2010.

Eleven countries in this Top 35 come from Europe. That is a relatively larger part than the Americas and Asia comprise. According to this UN report the order of the 11 European countries is as follows: 1. Denmark, 2. France, 3. Estonia, 4. Sweden, 5. Luxembourg, 6. Netherlands, 7. Lithuania 8. United Kingdom, 9. Belgium, 10. Malta and 11. Spain (see Annex 2).

Perhaps more telling is a percentage list of facilities in e-information, e-consultation and e-decision-making offered by countries. This indicates the supply of facilities by governments as measured by the UN. It shows that government-centred e-Participation supply still is a

minority phenomenon in the world, even in developed countries with high Internet and PC diffusion rates. It again shows that applications of information and consultation are more widespread than applications of decision making.

Table 1: Facilities of e-Participation (information, consultation and decision making offered by 189 countries in 2008)

Countries providing e-Information facilities

	Number of Countries	Per cent
Government provides a clear and explicit written e-participation policy or mission	37	19%
E-mail alerts for e-participation purposes	21	11%
RSS used to update and involve citizens	20	10%
Written calendar listing of upcoming online participation activities	21	11%

Countries providing e-Consultation facilities

	Number of Countries	Per cent
Use of polls to solicit citizen opinion	32	17%
Use of chat/instant messaging to solicit citizen opinion	10	5%
Use of weblogs (blogs) to solicit citizen opinion	8	4%
An open web forum for discussing any topic	26	14%
An open online discussion forum specifically for policy issues	23	12%
The content of past discussions in an online forum is posted	22	11%
Formal online consultation process offering a structured way for citizens to comment on government laws or policy	21	11%
Non-formal online consultation mechanism asking for citizen feedback on policies and activities	18	9%

Countries providing e-Decision making facilities

	Number of Countries	Per cent
Government commits itself, formally or informally, to incorporating the results of e-participation into e-decision-making	22	11%
Explicit acknowledgement of received e-opinions, e-deliberations and e-interactions	18	9%
Government sends a 'sent receipt' to citizens after receiving input, including a copy of what was received, by whom, time/date received and estimated response time	12	6%
Officials moderate e-deliberations online	6	3%
Government publishes findings/results of citizen opinions, including e-opinions, on website	23	12%

Source: United Nations E-Government Survey 2008

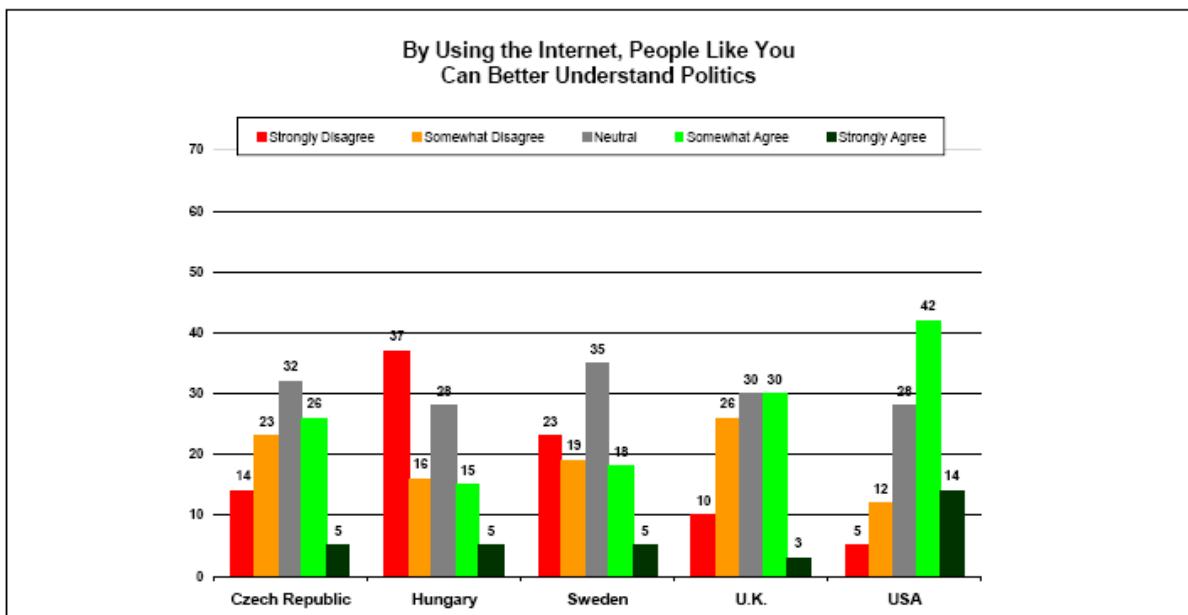
4.1.2 Information: better informed policies?

In all applications of e-Participation one of the main goals is to mobilize and exchange all relevant information in society on the issue under consideration in order to improve policy making. This goes both for governments or public administrations and for citizens. Some governments and administrations want to mobilize unknown expertise in society and some also want to know what is going on and what the moods and opinions of citizens are. Often they also want to inform, that is wage information campaigns in the shape of participatory methods on order to be more effective. On their turn some citizens want a (powerful) audience (the government and the administration) to receive their views, needs and complaints. Or they want an audience among fellow citizens that are interested and perhaps want to achieve the same goals.

However, most applications of e-Participation or not (yet) frequently offered by governments (see former paragraph) nor frequently used by citizens. It seems wise to first look for the attitude and motivation citizens have in using tools of ICT as a means to participate and to have more impact in policy making. The results of the World Internet Report discussed in the D3 Topic Report 2 (Report on Findings from Flash Eurobarometer) reveal a rather sceptical European population. We will cite parts of pages 95 and 96 of this report.

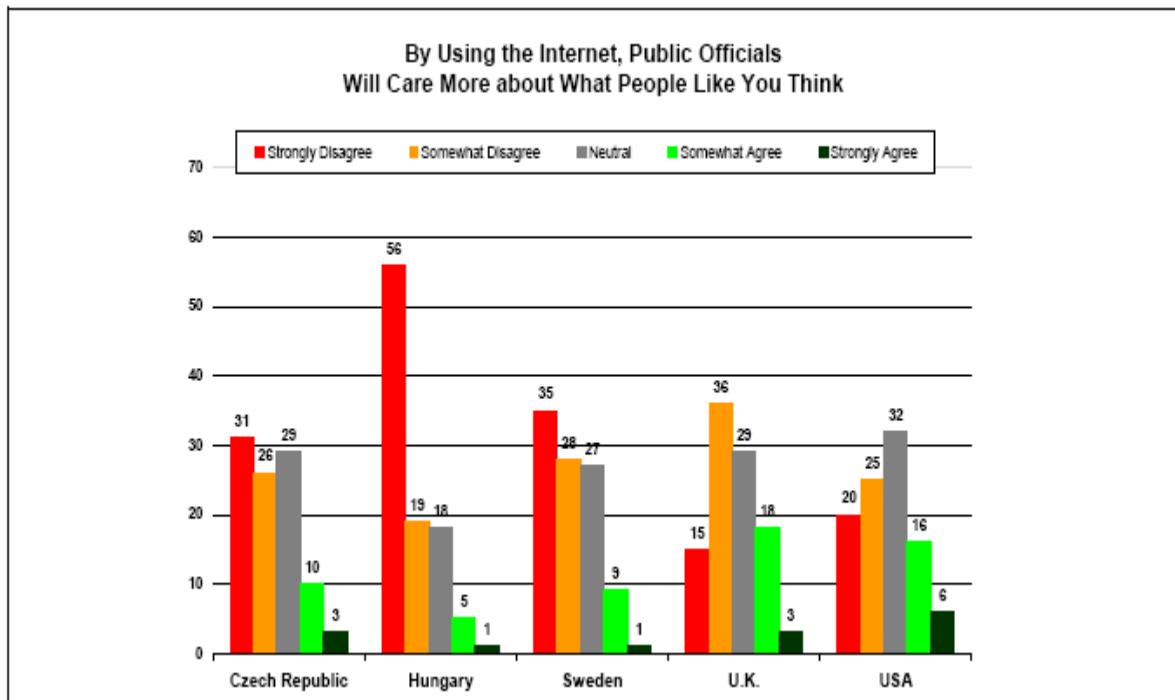
There appears to be wide-spread scepticism with regard to the Internet's effect on the behaviour of politicians and public officials as the following Figure 6 shows.

Figure 6: Perceived Effect of Internet use on Ability to Understand Politics, 2007



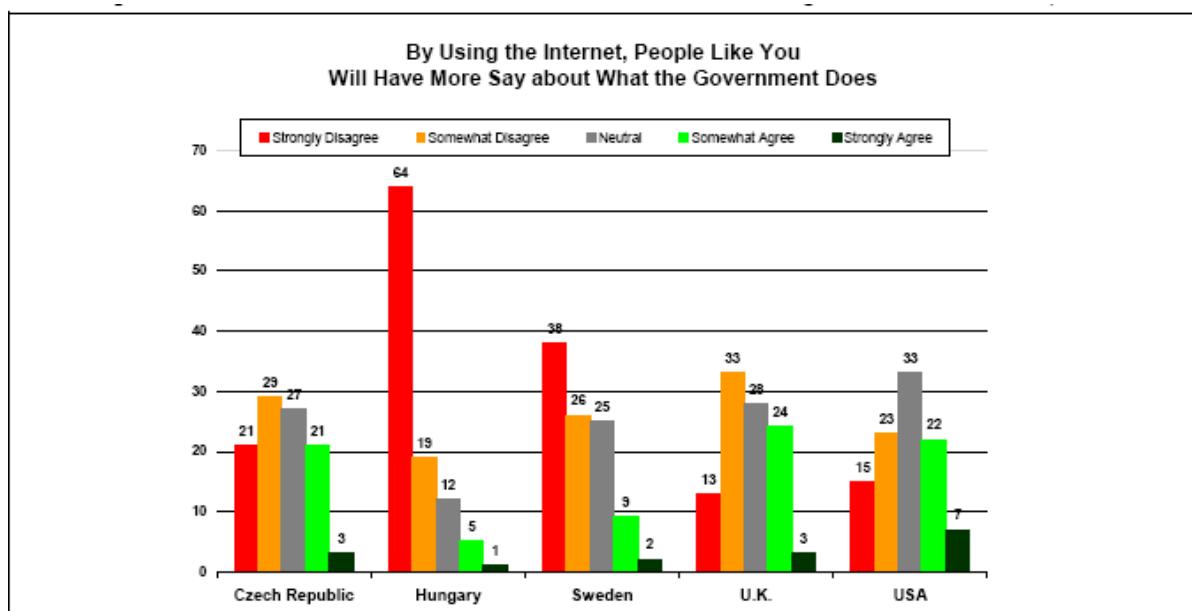
Source: Lengyel and Lorincz based on WIP data 2009

In all countries except for the USA more than half of all Internet users “strongly disagree” or “somewhat disagree” with the statement that the Internet “will make public officials care more about what people like you think” (Figure 7). A mere 6% (Hungary) to 22% (USA) agree to the statement (“strongly” or “somewhat”).

Figure 7: Perceived Effect of Internet use on Public Officials' Attitudes, 2007

Source: Lengyel and Lorincz based on WIP data 2009

Results to a question about the perceived effect of the Internet on the degree to which people have a say about what the government does (Figure 8) are in line with the previous ones. Again, a large share of Internet users appears to be careful if not cynical about the extent to which they will be able to exert an influence on politics in spite of ICT's potential to enable a more transparent and inclusive policy-making process:

Figure 8: Perceived Effect of Internet use on one's influence on government behaviour, 2007

Source: Lengyel and Lorincz based on WIP data 2009.

In the most recent 2008 TRANSFORM 12 Region Internet User Survey Report D 3) of all perceived effects on regional living conditions the perceived effect of the internet on '*Making one's voice heard in local politics and public life*' receives the lowest positive rates of all conditions (on average 39.5 per cent positive answers)²⁵.

Clearly, the crucial factor here is *trust* in government and in current institutional politics and public officials. According to an overwhelming body of literature from social and political science trust in these institutions and their representatives has declined in recent times. The point here is that European citizens are rather sceptical about the potential of ICT to change this. Europeans appear to be more sceptical about this potential than Americans, for instance.

However, there is another side to this. When we take the most recent Flash Eurobarometer we can see that the statement *The Internet has improved the way you deal with public authorities* is approved by 47.8 percent. The statement *The Internet has approved your capability to be informed about current issues* even receives 86.7 percent support²⁶. Here we are dealing with e-Government or online public services (not with most forms of e-Participation) and with the Internet as a highly valued new mass medium of information. It may be that these more instrumental or businesslike applications of the Internet in the public domain are much more valued by European citizens than the traditional political applications. Right from the start e-Participation was drawn in the political context of citizen to government relationships, that is to say a democratic perspective. It could be that applications of e-Participation focusing on immediate, daily issues of people that are close to them and that they care about, such as their living environment, community life, health and education have a more promising future than classical political issues. We will come back to this important hypothesis in the conclusions.

Better informed policies by means of e-Participation do not only depend on the interests, motivations and supply of governments and public administrations and the attitudes, motivations and actual demand of citizens, but also on the *quality* of information exchanged. The quantity usually is no problem except for the usual problem of information overload. Not all information exchanged on the Internet is valid and reliable, not even that of governments and public administrations. When exchange means discussion or deliberation the tone and style of the computer-mediated communication practiced also is vital. This can be both constructive and destructive.

4.1.3 Trust, transparency and openness

One of the main goals for experiments in e-Participation is the increase or recovery of trust between citizens and governments. We have to conclude that, so far, they have rarely achieved this. When expectations among citizens are raised by governments that offer venues for participation and these expectations are not met they can even lead to the opposite: a decline of trust. Transparency and openness are the basis of trust (Millard, 2008, p. 30). Both governments and citizens have to be transparent and open about their intentions and operations. This sounds like a fairly idealistic principle but in fact it is a necessary characteristic for a working communicative relationship and for the creation of mutual trust. Citizens have to see how decisions are made, who takes them and why. They should be able to follow the operations of their representatives. In Section 3 we have seen that the applications of e-Participation in the phases of policy execution and evaluation are designed to do this.

Conversely, governments should be able to see what drives citizens. This happens in the applications discussed under the headings of agenda setting, policy preparation, decision making and policy execution in e-Government that is rooted in user registration and a user perspective. Governments have to be confident about the validity and fairness of citizens'

²⁵ See Table 46 in the chapter "Report on Findings from Flash Eurobarometer"

²⁶ See Table 24 in the chapter "Report on Findings from Flash Eurobarometer"

input. This is the reason why the security of the applications concerned and, when needed citizen identification is required to prevent fraud and manipulation from the side of particular groups of citizens.

Just one example is sufficient to explain the meaning of trust in e-participation. The scandal on the expenses of MP's in the United Kingdom in 2009, an affair that was discovered, documented and publicized by the traditional mass media (newspapers) after the event, could have been prevented by citizen control sites screening not only the voting behaviour but also the sidelines and expenses of MP's. This scandal was the biggest shock of trust in politicians in modern British history. Henceforward, the registration of sidelines and expenses by political representatives at all levels in citizen control sites can assist in restoring confidence in these representatives.

However, there are legitimate *limits of transparency and openness* in e-Participation. At the side of governments it must be acknowledged that complete exposure and monitoring of all operations of politicians and civil servants would be counterproductive (*ibid.*, p. 31). All negotiations and experiments, situations of uncertainty would be blocked. When government bureaucracies have to work strictly to the rules they will paralyze. They will avoid any risk. On the other hand, citizens (and companies) also have legitimate interests in limiting complete transparency and openness. These are the well-known interests of individual privacy and business confidentiality.

To prevent transparency and openness of becoming idealist notions realistic agreements have to be made for all applications of e-Participation that require the mutual consent of governments and citizens or businesses. They start with explicit rules and regulations, rights and responsibilities specifying the goals and means of these applications. Sometimes they can be assisted by instruments such as appeal procedures, Service Level Agreements and citizens charters (*ibid.*).

4.1.4 Efficiency: faster and cheaper policy making?

Another impact that is intended or not is increased speed of policy making. For example, a function of e-petitions is to gather support much faster than with traditional means. E-voting could be faster than the traditional polling station; referenda and opinion polls could in theory become instant and frequent events. A final example is e-consultation that will require less time and expenses than a long series of expensive local meetings to reach the same goal.

However, the question always remains whether speed goes at the expense of quality. Another basic question is whether direct inroads of citizen participation do not disturb a policy process that needs time for deliberation and consideration by representatives and administrators.

A final objection comes from e-practice in participation. Ever more experience shows that offline services and communications should not be completely replaced by their online counterparts. It is better to combine online and offline participation venues. This is the point of departure of the so-called *Multimedia Dialogue Approach* that is practiced in several countries of North-Western Europe (Kubicek et al., 2007). A multimedia approach certainly is not cheaper and faster; it might be more effective in reaching high quality and representative participation.

4.2 Networking and Social Capital

The power of e-Participation is the power of networking between governments and citizens and between citizens themselves. Here the new opportunities of peer-to-peer networking in wiki's, blogs, social networking sites and other social media come forward. What are the opportunities and threats of peer-to-peer networking for participation in official policy making?

The first opportunity is a multiplication of public spheres that gives every citizen the chance to participate in public life and public policy making. The traditional spheres created by the mass media (the press and broadcasting) or those existing long before the advent of the mass media in public meeting places such as markets, streets, parks, pubs and coffee houses are supplemented by all types of communities and online forums on the Internet. Together they create a 'mosaic of public spheres' (Kean, 2000) that are interlinked in all kinds of ways (e.g. TV-programmes and weblogs discussed in a pub).

The second opportunity is the rise of participatory mass media and online civic journalism created by user-generated content. This is the perspective of so-called Web 2.0. In the field of government issues and public policy at large (peer-to-peer) networking offers venues for political and cultural expression (free speech), mass creativity and the mobilization of more knowledge and innovative ideas that rest in society or among the people than ever before.

However, the first threat is a growing complexity and fragmentation of all these public spheres. Any oversight is lost and official policy makers do not know to what public spheres they have to turn to or what they should believe. So, they tend to stick to the traditional public sphere in the mass media they know and have access to. Many policy makers have doubts about the quality of user-generated content on the Internet and about its origin and representativeness.

So, the quality of the products of peer-to-peer networking might be a second threat. Ever larger quantities of output with low quality are produced. Research indicates (see above under online discussions) that without some kind of organization in the form of moderation, editing and filtering the quality of this input in public policy making is low. Internet critic Andrew Keen finds that "on the Net differences between information, advertising and sheer nonsense are blurring" (Keen, 2007).

For the applications of e-consultation, online discussions and the so-called tools of Web 2.0 (wiki's, social networking etc.) the opportunities of *collective intelligence* have a strong appeal. Collective intelligence is able to create reliable and valid information and decisions in groups (Sunstein, 2008) when:

1. Those who have the right information are motivated to contribute and those who don't keep silent
2. Mechanisms, stimulations and rules (moderators, editors) are available to guide the group process

These conditions explain why Wikipedia information might be right for 95-98%: those wrong are filtered by those right and by experienced editors serving as moderators. When these conditions do not apply *group dynamics* prevail (see the paragraph on online forums above). Experience shows²⁷ that collective intelligence works better when:

1. The collective does NOT define its own questions (this would lead to insulation);
2. Answers can be evaluated by a simple result (low complexity);
3. The information system which informs the collective is filtered by a quality control mechanism (with individual, independent reviewers and editors).

²⁷ See summary of literature in Sunstein (2008)

Some of the applications discussed above rest more on citizen-to-citizen communication than on citizen-to-government communication. This particularly goes for the applications that are based upon discussion and networking. They raise the opportunity to increase the social capital of participants. Some applications support (local) community building and long-distance communities-of-interest building. However, some highly individual, service-oriented applications might produce the opposite. For example, the citizen control sites enabling citizens to better choose their neighbourhood to move into might lead to more segmentation or segregation as they draw some people to the 'better' neighbourhoods while others remain.

Apart from these issues of community participation the social capital produced by community building is the topic of another domain report.

4.3 Empowerment and participation

One of the big issues in the debate around e-Participation is whether the applications discussed increase citizen participation, cause participation to become more unequal or even decrease participation (because some people do not like computer-mediated communication). Most current evidence points in the direction of increasingly unequal participation. This means that those that already participated to a large degree before are participating more in e-Participation. It gives them a new and potentially powerful tool. However those not interested, without sufficient citizen competency and obviously those without Internet access do not participate. Besides physical access the lack of digital skills is the most important problem. For most e-Participation applications a relatively high level of skills is required.

Many e-Participation project evaluations report the over-representation of middle-aged men with higher education. This seems to go less for popular applications such as e-petitions, e-voting guides and citizen control or information sites, while it seems to be stronger in applications requiring a high level of motivation and digital or citizen skills such as online plan consultations and online forums. The first mentioned applications have less flavour of advanced politics and address everyday interests and 'simple' voting decisions in elections. They might be more appropriate for participation among the population at large. These observations at a first glance are in need of confirmation.

However, there is also evidence that these applications are able to draw a larger part of young citizens into participation²⁸. This was certainly the case in the E-campaign of Barack Obama, though we don't know to what extent this was caused by the use of new media or by the attractiveness of the candidate to young American voters. In any case, it can be argued that young people will simply expect to be approached with these means by their governments, civil servants and political representatives. If this is true, they have no other choice than to spend more effort in tools of e-Participation.

The importance of inclusion in e-Participation simply cannot be overrated. Currently, e-Participation mainly reaches those that are already engaged, that intend to vote and dominate traditional channels of participation. Unfortunately, participation is very much linked to social class. Most political election research indicates that the traditional working classes and 'under-classes' of unemployed and migrants have less trust in government and political institutions in general than people from the new and professional middle classes²⁹. This goes all the more when government is far away and abstract, such as that at the European level. When the applications of e-Participation mainly reach the middle and higher social classes, as they currently do, they can have a back to front effect: they could increase instead of reduce the gap. For example, the European elections of 2009 have shown a rise of

²⁸ See for example Maier-Rabler & Hartwig (2007)

²⁹ The scientific literature shows mixed opinion about this statement. Some claim that the competitive pressures of globalization (for example of migrants and of companies moving abroad) fuel a loss of trust in government among the 'losers' in this process. Others observe that the greatest declines of trust are among the better educated and higher social classes as their rising expectations are not met by governments (see Dalton, 2005)

Euro-scepticism and nationalism and a lower voter turnout. So far, no instrument of e-Participation at the European or national level has been able to counter these trends. On the contrary, when the sceptical part of the population would observe that the instruments of e-Participation, that are already perceived to be difficult, are designed and dominated by the professional middle classes and that governments do not really care about the results, they will turn away from them and develop even less trust in government.

4.4 Information and Lifelong Learning

As has been claimed several times, information exchange between governments and citizens and between citizens themselves is the prime objective of all views and applications of e-Participation. According to Eurobarometer data European citizens underscore this objective confirming that the Internet has approved their capability to be informed about current issues. This is not only a matter of relatively passive information retrieval. Active contributions of information feedback to governments and public administrations have also become viable. The real new opportunity here is so-called *user-generated content*: the input of all knowledge citizens have in the policy process. Some even speak of a 'User-generated State' (Leadbeater & Cottam, 2008). However, what are the possibilities of user-generated policy content and collective intelligence on the Internet? We have discussed this under paragraph 4.2. Networking. We have seen that the validity and practicability of collective intelligence is conditional. One of these conditions is the availability of a sufficient number of *informed* citizens that have a reasonable level of formal education and that have learned a lot after formal education. Information and strategic digital and civic skills are vital for most forms of e-Participation .

The information exchange occurring in e-Participation in policy making will also require new ways to process information and new skills to participate. An important *second order effect* (see Conceptual Framework) of participation with new media is a change in the nature of policy making. This has always been a practice of meetings and face-to-face communication for talkers and organizers. They used verbal skills, management capacities and the art of negotiation. E-Participation is an individual or collective practice of citizens working behind computer screens using many techniques. This requires a routine of technical and symbolic-intellectual skills instead of practical organizational and verbal intellectual skills. What will be the impact: the second replacing the first? Or will they supplement each other and integrate? One thing seems certain: on top of the traditional skills people need to participate as a citizen, such as the knowledge of how the government and public administration work and how to influence this, they will need a number of digital skills that are new to many people, especially the elderly and low educated people that do not use a computer at work.

5 Conclusions and Policy implications

5.1 Conclusions

As announced before, on account of the lack of conclusive results of scientific e-Participation research and systematic evaluations of e-Participation projects we can only give provisional conclusions of an impact analysis here. All statements listed below can be treated as hypotheses in future research and project evaluations. The conclusions are broadly in line with those of Millard et al. in their 2007 report *European e-Government 2005-2007*. However, conclusions have been extended and sharpened according to the survey of results in this report.

Effectiveness

1. Influence on policy and politics

Currently, scarcely any influence of e-Participation projects or experiments on institutional policy and politics can be observed. Few decisions of government, political representatives and civil servants have changed on account of the input of individual citizens in e-Participation³⁰. The electronic channels of participation used are simply added to the traditional channels. Only 15,2 percent of European Internet users has practiced one of the many applications of e-participation at least once a month in 2008³¹. Decision makers doubt the representativeness, surplus value and quality of the input of the new channels. Few decision makers are prepared to accept the direct inroads of e-Participation on their decisions. All this does not rule out that ICT is more effectively being used at the level of organized interests of NGOs, political organizations and civilian organizations. However, the prime goal of e-Participation has always been to engage individual citizens better and more directly.

2. Policy phases emphasized

E-Participation is most frequently used in the first phases of the policy process: agenda setting and policy preparation. Policy evaluation is a second area, mostly entered on the initiative of citizens (organizations). Governments and public administrations rarely allow entries to the core decision making and policy executing phases. They claim that this does not correspond to our representative political system and the responsibilities of the public administration. Participation in and user-centred design of online public services in policy execution is still in its infancy.

3. E-Government and e-Participation

Thus far, e-Government seems more successful than e-Participation. In opinion polls citizens reveal a positive attitude to the improved electronic information provision of governments and administrations and to the public services of e-Government. Opposed to this, they are sceptical, sometimes even cynical about the Internet's effect on the behaviour of politicians and public officials and about its potential of having more to say in government affairs.

4. Closing the Gap?

The main motive for governments and public administration to start experimenting with e-Participation is to close the gap that is perceived to be growing between governments and citizens and to boost the legitimacy of government policy and administrative decisions. So far, this has not occurred. This is both on account of the sceptical attitude of many citizens and of

³⁰ The only exception observed in this report is the withdrawal of a road pricing plan by the UK government after petitioning. See e-petitions.

³¹ See Table 1 at page 56.

the unconvincing reactions of political representatives and civil servants to the results of e-Participation projects. Research indicates that many citizens are prepared to accept and take part in e-Participation projects provided that governments and administrations clearly take the input of citizens into account and provide feedback to citizens about what they have done with their input in their final decisions³². Offering e-Participation opportunities to citizens by governments is a question of a management of expectations³³: expectations are raised that should not be disappointed. When this happens often, the gap increases instead of being reduced by e-Participation. E-Participation is no technological fix for basic democratic deficits in advanced democracies.

5. Government or citizen initiative?

The overview of e-Participation applications in Section 3 raises the suggestion that applications of e-Participation on the initiative of citizens or civilian organizations and new media developers are more successful than those initiated by governments. E-petitions, e-voting guides (made by independent organizations of politically motivated citizens and software developers), e-complaints, e-surveillance and citizen control sites are more popular than online open and plan consultations and official online discussions. Official e-voting also still is in its infancy.

6. Incorporation of e-Participation in Government.

One cause for this difference might be the perceived problem of a lack of trust and legitimacy in the relations between governments and citizens. Another might be the trouble governments and public administrations have with the incorporation of the initiatives and results of e-Participation in their regular operations and modes of governance. "Most administrations do not (yet) have mechanisms and capacities in place to cope with a significant increase in participation" (Millard et al., 2007, p. 76).

7. Traditional political or everyday life issues?

The former wave of e-participation experiments during the Internet hype was overloaded with utopian visions of a 'new democracy' or 'teledemocracy'. During that time many European governments waged experiments with online plan consultations and debates. The results were disappointing as they did not draw more citizens into engagement with public affairs and because they rarely led to clear and usable results. With the appearance of Web 2.0 these visions reappeared, this time resting on fundamental changes of the Internet enabling much more active and creative users. These changes are real and important. However, they do not automatically produce active citizens with increased motivation to engage in public or political affairs. As argued before, there is no technological fix for such basic problems of motivation. In this report it was observed and suggested that applications of e-Participation that appeal to the everyday interests of citizens in their own environment might have more appeal to them than traditional issues of politics and public affairs that are abstract and far away. Others support this hypothesis: "Increasingly, the focus appears to be on issues that 'people really care about', such as social security, health, education, environment, and, as mentioned above the very immediate, daily issues" (*ibid.*).

Efficiency

8. Cheaper and Faster Policy Making?

So far, e-Participation has not resulted in cheaper and faster policy making. The new applications require a lot of investment. A multi-channel approach remains necessary to

³² This corresponds to the results of a large-scale survey in the Netherlands that was conducted for a Ph.-D. Thesis (see Boedeltje 2009).

³³ According to modern political theory the perceived gap between governments and citizens is less an issue of bad governments than an issue of governments not being able to meet the rising expectations of increasingly informed and demanding citizens (see Dalton, 1996 and Dalton, 2005)

reach all citizens and to stimulate not only the quality but also the quality of input. This approach is more expensive than the traditional approach of talks, meetings and print media.

When policy making with e-Participation happens faster than before, this does not have to be progress according to all views of democracy. The fast and direct democratic applications of e-voting, e-referenda and e-petitions run the risk of populism according to most views of democracy. They prefer some time for consideration in a representative system.

9. Lack of explicit project goals

It is difficult to evaluate the efficiency of projects or applications of e-Participation when no explicit goals and public or political motivations are stated in advance. Few want to run the risk of not reaching explicit goals in what essentially still are experiments. However, in this way governments, public administrations and civilian organizations do not sufficiently learn from previous results and are not able to improve applications.

Education and Lifelong Learning

10. Learning effects of e-Participation

E-Participation might not (yet) have an impact on actual decision making, but probably it is already more effective in producing learning among participants. It is able to contribute to informed citizenship. For example, even when online plan consultations and online debates do not lead to conclusions, decisions or effective policy making they can have a particular effect on the consciousness and knowledge of participants. In the conditions of lifelong learning this is an important effect that builds future engagement and informed citizenship.

11. Mobilizing creativity

What e-Participation projects are able to do anyway is to mobilize unknown creativity and expertise in society at large, both among professionals and lay people. In e-Participation projects it is often experienced how much knowledge and suggestions for solutions are available among the population. For politicians and civil servants they also serve as a social antenna. In a short period of time they are able to derive what lives among particular populations.

In the extremely complex modern society it simply cannot be assumed anymore that governments and public administrations concentrate all knowledge and creativity. The citizenry has to be mobilized.

Networking and Social Capital

12. The Promises of Collective intelligence

Collective intelligence in applications of e-Participation on the basis if networking is able to produce 'wise crowds' with great contributions under particular circumstances. When these conditions are not met it can just as well produce 'stupid mobs' of people that run after each other. Main conditions are that mechanisms, stimulations and rules (moderators, editors) are available to guide the group process

13. The Primacy of Civil Society in Networking

Currently, peer-to-peer networking and the production of collective intelligence are more likely to work inside civil society and among individual citizens than between citizens on the one side and governments and public administrations at the other. These horizontal modes of information exchange do not fit into the vertical modes of organization and information processing in governmental hierarchies. Applications of e-Participation that assume an open, free and equal debate between political representatives and citizens run a high risk of failure. What frequently happens is that civil servants run these debates with citizens, more or less on account of governments or political representatives. This is not the role they should play

in our representative system with the primacy of politics for representatives and an executive role for civil servants. It is the prime responsibility of political representatives to communicate with citizens.

Empowerment and Participation

14. The Quantity of Participation

So far, the number of participators in public policy making has not increased with the transition to e-Participation. Those already participating to a high degree in traditional modes and media of participation also are the frontrunners in e-Participation. This means an overrepresentation of high-educated and already engaged citizens and in some applications an overrepresentation of males. Young people are not drawn more in participatory processes by means of e-Participation, though it has to be emphasized that they probably will participate a lot less when the new media are not used.

As argued before, empowerment happens more via de support of informed citizenship than through the impact on official decision making.

15. Digital Skills required

One of the main problems for a growth of participation in e-Participation is that this requires a number of additional skills added to the traditional skills of citizenship (social skills and knowledge of how the government and decision making work and what rules and regulations hold). These are several types of digital skills: operational skills for computers, browsing and navigation skills for the Internet, information skills for searching information on the Web and strategic skills for using applications such as those of e-Participation for ones own benefit (van Deursen & van Dijk, 2009). These skills are very unequally divided among the population. When this does not change by means of better accessible and usable e-Participation tools and by means of more training of digital skills e-Participation will not empower citizens more than old modes of participation.

5.2 Policy Suggestions

Finally, we present a Top 10 of policy suggestions related to the impact analysis in this report and the conclusions above.

1. Clarify goals and means and evaluate systematically

Most failures of experiments of e-Participation by governments inviting citizens can be ascribed to the omission to clarify the goals and potential outcomes in advance. In this way the effectiveness and efficiency of these experiments cannot be determined. There should be more systematic scientific research of e-Participation. Research should overcome its current descriptive and normative nature and develop both theory and practical improvements. However, the evaluation of all projects with an evaluation framework for e-Participation projects, such as an abbreviated form of the framework in Annex 1, has the highest priority.

2. Clarify rights and responsibilities of e-participation stakeholders

Often citizens were disappointed when they noticed that representatives, administrators and politicians ignored their input and nothing was done with it because this did not fit into the scheme of responsibilities and regulations. Moreover, goals were not clarified because in fact the application was a matter of 'playing' with fascinating new technologies.

This means that the rights and responsibilities of all stakeholders in e-Participation projects should be defined and expressed in advance. "Traditional systems and patterns of governance are increasingly being challenged, so it is important to strike a balance between the rights and responsibilities of stakeholders"(Millard et al., 2007).

3. Clarify views of democracy (participation and representation)

Behind experiments of e-Participation usually hide different views of democracy that are rarely made explicit. This complicates evaluations and leads to disappointments among stakeholders. The problems of e-Participation rarely have a technological background; basically they are political as they rest on particular assumptions about the transformation of governance and about active citizenship. It appears to be difficult to incorporate results of e-Participation in representative systems and the workings of public administrations. So, "Governance and democracy systems need to be re-examined, both supported by and independent of ICT" (ibid., p. 76).

4. Adapt government and public administration to incorporate e-Participation: develop transparency and responsiveness

The most far-going and difficult to attain policy suggestion is the adaptation of government and public administration structures to enable the input of e-Participation

When governments and administrations will continue to operate with the same closure and rigidness citizens often experience, e-Participation will not work. The responsiveness of governments and transparency of public administrations for citizens will have to be improved.

They will at least have to show that they are listening and provide serious feedback to citizen input.

5. Pay more attention to e-Participation in the area of everyday issues of citizens

As has been argued before citizen-centred e-Participation is relatively successful. Issues of criminality, community affairs, social security, health, education and the environment are far more popular than traditional political or policy issues of large-scale planning. They are addressed in citizen control sites and other practical tools for citizens. It is striking that frequently these tools are offered by commercial organizations processing publicly available government data.

6. Tune government initiatives to citizen initiatives

Section 4 described a conspicuous split between government and citizen initiatives. Governments and administrations will be more effective in practicing e-Participation when they tune their initiatives with those showing real potential and attention among the citizenry. It should be investigated which are the areas and initiatives concerned.

7. Provide reliable and usable information

Another critical success factor of e-Participation is the reliability and usability of the information exchanged between governments, administrations and citizens. At least the information of governments and administrations should be reliable and accessible or usable by all citizens.

8. Stimulate innovations of hardware and software enabling e-Participation

Effective applications of e-Participation do not show up automatically. Many experiments with them are not organizationally and technically sound. Experience has to be built and investments should be made into the hardware and software innovation of e-Participation. They should pay special attention to the accessibility and usability of the software tools for citizen users.

9. Develop demand-side strategies for the improvement of e-Government online public services and try user-centred participatory design

In the phase of policy execution e-government services of information and transaction should benefit from user experience and user data. So far, a supply-side orientation governs the design and realization of online public services. This requires a benchmarking of the performance of these services from a user or citizen perspective and it requires more participatory design of these services..

10. Stimulate the widest participation among the population

Policies to support e-Participation should always be accompanied by attempts to improve the accessibility and the digital skills required among users.. It is almost a tautology to say that the extension of participation is one of the most crucial factors of success or failure of e-Participation. This should support inclusion instead of reduce it Except for the improvement of digital skills the following five actions are vital to stimulate the widest participation among the population:

- Use techniques to simplify and popularize complex policy issues such as popular language, visualization, simple models, games and simulations;
- Focus on e-Participation applications dealing with everyday issues of citizens;
- Focus on clear issues, even single issues, instead of complex and abstract political discussions, even when they run the risk of supporting populism;
- Link large-scale European and national issues to local issues;
- Link e-Participation applications on a European and national scale to those at a local scale; for example, it is extremely difficult to draw more attention to European or EU issues by European applications of e-Participation only.

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Appendix

Annex 1: EVALUATION FRAMEWORK FOR E-PARTICIPATION PROJECTS

I. PROJECT PERSPECTIVE

Project management

- Goal clarity; resource planning; responsibilities
- Quality of tool selection and implementation; resource efficiency
- Coordination of online and offline processes

Engaging with a wider audience

- Promotion measures; outreach
- Incorporation of (multiple) target group perspectives in service design
- Accessibility; inclusiveness; barriers to participation

Community development

- Participation and networking patterns

Obtaining better-informed opinions

- Relevance and quality of information
- Learning effects over the participation process

Process quality

- Gap analysis against standards and good practice
- User and stakeholder identified areas for enhancement
- Integration of online and offline processes
- Harmonisation of work-practices of authority and eParticipation processes

Scope of deliberation

- Extent of interaction amongst participants; level of involvement
- Extent of rationality and use of arguments

Effectiveness

- Cost/time effectiveness of processes and structures (e.g. cost savings/time savings in providing, aggregating and evaluating input)

Feedback behaviour

- Response measures set by project organisers; rates and timeliness of response
- Feedback content and quality; participants' satisfaction with feedback

Sustainability

- Level of key stakeholder support; provision of resources and maintenance
- Stakeholder perception of continuity barriers
- Level of institutionalisation of education and training for government officials

II. SOCIO-TECHNICAL PERSPECTIVE

Social acceptability

Trust and security	Information is presented accurately, completely and reliably Information users have provided is handled in a secure manner Data handling procedures are in compliance with relevant legislation or guidelines
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Relevance and legitimacy

Tool meets a purpose relevant to individual users' and community's needs

Content and surrounding processes are relevant to that purpose

Usefulness

Accessibility

Level of compliance with Web Accessibility Initiative (WAI) content guidelines is sufficient to serve users with special needs

Alternative access over public access points, mobile devices or offline channels is possible

Identification of access barriers

Public take-up relative to expectations

Target users are satisfied with the tool, show interest in using it and willingness to return to the site

Identification of usage barriers

Number of users, extent/frequency of their use of the tool

Appeal and usage

Content clarity

Users understand what the content means in the context of the task or situation

Responsiveness

Tool allows to answer the user's questions quickly and effectively

Site provides contact information, FAQs, search functions

Interaction

Tool supports the level of interaction required by the process

Good practice

Level of consistency with current developments, good practice guidelines, standards in the field (e.g. interoperability standards)

Usability

Navigation and organization

Sufficient and consistent information about users' current position on the site, path taken, and available options

Time needed to perform a task

Efficiency and flexibility

Appropriate short-cuts for doing repetitive or familiar tasks

Adequate fit with variations of individual circumstances

Error recovery

Users can undo previous actions

Users are guided effectively on the correct procedure and can continue the task without distraction or hesitation

System security

Level of stability of operation without unintended interruption or periods of

III. DEMOGRAPHIC PERSPECTIVE

Representation

- Fit with legal frameworks/legal stipulation for participation procedure
- Integration with 'offline' participation channels
- Fairness of interest representation

Support of engagement

- Availability of information on democratic processes and rules of (e-)participation
- Citizens' knowledge about participation opportunities/existing initiatives
- Knowledge increase about democratic processes and rules of (e-)participation
- Participation supply and demand (number of initiatives, access numbers, active membership in networks or interest groups)
- Level of citizen involvement in identifying subjects of eParticipation

Transparency and accountability

- Publication of contributions to/results of participation process
- Public discussion on final results with involved actors
- Transparency on involved actors and responsibilities
- Transparency on how contributions are processed and decisions taken

Conflict and consensus

- Identification of "pros and cons"; handling/visibility of minority opinions
- Participation policies (e.g., moderation, etc.)

Political equality

- Pluralism, openness of participation process
- Contribution to reduce barriers to participation or barriers to active citizenship

Community control

- Participant satisfaction with participation effects

Source: Aichholzer & Westholm (2009) and DEMO- net

Annex 2: Evaluation criteria Framework for e-Participation Projects.
UN e-Participation Index (Top 35 countries from 2005 to 2010)³⁴

Country	2010 Index	2010 Ranking	2008 Ranking	2005 Ranking
Republic of Korea	1,0000	1	2	4
Australia	0,9143	2	5	7
Spain	0,8286	3	34	81
New Zealand	0,7714	4	6	5
United Kingdom	0,7714	4	25	1
Japan	0,7571	6	11	16
United States	0,7571	6	1	3
Canada	0,7286	8	11	4
Estonia	0,6857	9	8	9
Singapore	0,6857	9	10	2
Bahrain	0,6714	11	36	41
Malaysia	0,6571	12	41	33
Denmark	0,6429	13	3	6
Germany	0,6143	14	74	12
France	0,6000	15	3	18
Netherlands	0,6000	15	16	8
Belgium	0,5857	17	28	13
Kazakhstan	0,5571	18	98	31
Lithuania	0,5286	19	20	17
Slovenia	0,5143	20	55	30
Austria	0,5000	21	20	18
Norway	0,5000	21	16	19
Cyprus	0,4857	23	98	39
Sweden	0,4857	23	9	11
Croatia	0,4571	25	78	33
Colombia	0,4429	26	25	10
Ireland	0,4429	26	49	32
Kyrgyzstan	0,4286	28	78	34
Mongolia	0,4286	28	47	28
Finland	0,4143	30	45	12
Israel	0,4143	30	38	24
China	0,3714	32	20	32
Mexico	0,3714	32	7	6
Chile	0,3429	34	71	10
Malta	0,3429	34	32	15

Source: UN Government Development Knowledge Base

³⁴ Due to changed counting method 2005 and 2008/2010 ranking data may not directly be compared

[B] Education and Lifelong Learning

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Piet Kommers

Textual contributions of Karsten Gareis and advices by Johannes Cronje

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0 Executive Summary

Life-long learning is an important application field for ICT; Learning is a vital element for the evolution of society and social awareness. Education and learners themselves are quite aware of the strategic value of ICT. Web-based “learning support systems” and even “web-based communities” stay behind in grasping the full potential of collaborative learning. Limiting factor for the full adoption of ICT in orchestrated education is the “Overall Contract”: Novices are supposed to learn what the experts already know. Testing and certification has become a goal in itself; Learning effects that are hard to assess tend to be ignored. Life-long learning is complementary to the majority of subsidized education; its goal is to embed the many types of learning in day-to-day life.

In the Lifelong Learning domain Europe is facing a growing demand for the acquisition of new skills beyond the time spent at formal educational organizations such as schools and universities. As formal educational organizations should prepare learners for lifelong learning and could make their organizational structures more supportive for this type of learning, lifelong learning and formal education are not to be analyzed separately, but were both tackled in the Domain Report.

A large part of Europe’s older population has no experience in using ICT for learning at schools or workplaces. They run a danger of exclusion, not only in the form of e-exclusion in regard of today’s media world, but also as a result of this from social life in general. With today’s fast turnover in applications for communication and cooperation, lifelong learning has become a necessity for everybody. To fully participate in a society which is increasingly dominated by knowledge- and information-rich environments and technologically mediated communication, direct ICT-related skills are required – but not enough: they need to be complemented by digital literacy skills such as information and strategic skills, which go much beyond mere e-skills.

There is substantial evidence suggesting that Europeans at risk of social exclusion tend to lack digital literacy skills more than they suffer from a lack of e-skills in the narrow meaning of the phrase. Performance tests have shown that endowment with operational skills is reasonable widespread, but that average performance concerning information and strategic skills on the Internet is far below expectations – even among the younger generation, which are often assumed to be “digital natives” almost by default. Further basic skills needed for lifelong learning are skills of critical thinking, e.g. in the context of evaluating results of information searches on the Web. In the face of an explosion of information availability, caused mainly by the success of the Internet, a deliberate and critical attitude towards any kind of information offers and media has to be learned.

Formal education could do better to prepare pupils and students for lifelong learning. ICT use in formal education is often used to streamline bureaucratic procedures such as informing students, collecting homework, or organizing tests, rather than to support creativity and critical thought. This is clearly enabling students to manage their courses and access learning content from home and teachers to manage their working time more efficiently, but there still appears to be insufficient use of more advanced learning forms such as computer-supported cooperative learning. The reason for this appears to have to do with the bureaucratization of formal education; the focus is still too much on conveying an ever-growing canon of knowledge, and too little on enabling students to learn how to learn.

In contrast to the rigid organisation of formal education, pupils, students and other individuals seem to learn on their own initiative and learning styles amply using ICTs. For instance, students who enter higher education today are likely to be proficient already in mastering web-based social networks, their tools, conventions and etiquette. Mobile devices and flexible software tools are fully integrated in their daily life.

Outside of formal education, people share knowledge in networks or Communities of Practice, which become of utmost importance for acquiring necessary expertise in ever-changing environments. Related informal learning does not necessarily mean un-institutional learning. There have to be new forms of bringing formal and informal learning together. This demands new forms of organization, certification and remuneration of learning and teaching or coaching.

The focus of this report is the recent, contemporary and next future impact of ICT on life-long learning. Why is this question of prime importance? First of all because traditional research methodologies have failed to get clear answers on the added value of ICT on learning effectiveness; (Cox & Marshall, 2007). Secondly because ICT and the “Networked Society”¹ are inextricably connected. Life-long learning seems to be more urgent than ever as networked societies both offer and need a swift generation and altruistic exchange of ideas. The notion of life-long learning has evolved in the midst of the 20th century when it became clear that educational learning did not manage to supply the knowledge for one working generation any more. Even more important was the awareness that knowledge and expertise was an ever-evolving process rather than a static resource. While focusing on the specific effects of ICT on life-long learning, this report articulates that during its institutionalization, education has marginalized its ambition to stay a “learning organization”. According to the report “Cross-Roads of the New Millennium; Proceedings of the Technological Education and National Development” is becomes widely accepted that through ICT-based Life-Long Learning.

While focusing on the specific effects of ICT on life-long learning, this report articulates that during its institutionalization, education has marginalized its ambition to be a “learning organization”; If your goal is to make others learn, it looks like interfering to accept that you as teacher are in the midst of learning yourself as well. ICT as enabling infrastructure cannot mitigate this perceived infringement of the overall contract, except that it makes learning institutions even more keen on the potentially negative side effects of ICT; negative in the sense of ‘conflicting with the fixed curricular goals’. A good example is the large number of schools that prohibit learners to use their mobile phones even if it is for searching for information. If we take into account that at the same time this enquiry attitude is one of the most essential predictors for successful professional learning than we realize that we have touched a rather sensitive declination between school-based and life-long learning.

The evolution and intrusion of ICT for Life-Long Learning has been built upon three main trends:

Trend 1: ICT tools and methods for learning have initially been developed for the sake of supporting individual learning processes. Ideals like adaptiveness, differentiation and individualization have been the main values for undertaking the many projects in “Intelligent Tutoring”; all attempts to exceed plenary and collaborative teaching practice. The main effect of these ambitious projects has been the recognition that it is hard to emulate person-to-person communication and its senses for mutual understanding.

Trend 2: Quite different are the institutional ambitions to involve ICT systems for mainstreaming the diversity of students. Its underlying attempt is to make learners fit in a workflow regime. Though its adagio is “study where- and whenever”; you have always access to your resources and even to your study mates. In practice these so-called web-based learning support systems have led to an ever more prescribed study mode and study speed; as all details are on the web, there is no excuse for the student to stay

¹ [ED447284 - Lifelong Learning for the Global Networked Society.](#)

behind other than having ignored the study guide. This is exactly what institutes need in order to reduce risk and student indolence.

Trend 3 is the learner who continually develops a personal learning style via networks as they develop on the web. This process is the most prospective candidate for ICT-supported life-long learning. In contrast to institutionalized (formal- and certificate-driven) studying this learning process has a just-in-time nature, and allows a much greater deal of intrinsic motivation as its goal is to find immediate answers for a current situation.

Trend 4: A special case is the learner who is not keen on being certified. This may be the largest group of learners. (S)he learns in order to perform better (professional increment) and benefits from the web as open access source of expertise.

The choice of this project to highlight ICT for “Life-Long Learning” already shows its implicit expectation that neither the first- nor the second trend is an acceptable candidate to be extrapolated in this study. The third trend is indeed the most likely one that will transcend from all current practical constraints. The intriguing question then is if and how regular education will accommodate or even incorporate this growing momentum of the “emancipated” learner. As illustrated in this report it is the “Overall Contract” that allows regular education to continue Trend 2. Its ideal is to optimize the learner-throughput and to refrain from diversity in terms of students’ individual characteristics. For this reason it is quite likely that a dual situation will survive for quite a number of years. At one side it is Trend 2 where institutes attempt to streamline the variety of students with the help of Web-based conveyance systems. At the other side students will continue to articulate highly personal traits in learning style, personality and a large variety in prior knowledge. As Web-based learner communities develop it will become more and more problematic for institutes to ignore these two tracks. Some of them will promote the situation of blended learning: Help students to achieve the prefixed curricular goals via a wide landscape of alternative roads and via acknowledging students’ individual portfolio master pieces plus granting shortcuts based upon so-called “Externally-Acquired Competences”.

1 Introduction

The aspect of ICT-supported Life-Long Learning (L.L.L) is one of the most convincing exemplars of how society has been affected by new technologies, and also will be transformed further in the coming decades. Its essence is that the conventional criterion for learning effectiveness has been limited to transferring knowledge and skills from prior experts to youngsters. Traditionally the goal of L.L.L. was to make the learner to incorporate and apply existing knowledge. Nowadays, ICT-enabled learning makes learning a matter of participation, development and creation. Not in the least place, this new apprehension of learning has enabled individuals to gain a greater societal awareness and -participation and achieve personal well-being and economic wealth as well (Gillmor, 2004).

- Until the mid-eighties of the twentieth century, the major argument to adopt the L.L.L.- rather than the instructional paradigm was the need to increase the speed of innovating expertise; in order to shorten the lifecycle of professional skills and its underlying conceptual knowledge base.
- In the nineties the more fundamental paradigm shift arose that both formal and vocational and informal learning should target the continuous stream of reapprehending the pragmatic utilisation of knowledge- and expertise domains anyway; learning as a process of transfer and consolidation got continuously more the characteristics of a catalytic process.
- During the first decade of the 21st century the major consideration became in how far regular education could essentially accommodate this revised paradigm. ICT-based learning as manifestation of the so-called “new learning” was disputed and rejected to a large degree.

Two main effects of ICT in L.L.L. should be distinguished across the two strands:

1. The web as the access and connectivity source for Informal Learning. The commodities nowadays to access expertise and gain factual information via the web persons who lack a certain expertise. This urgency- or curiosity driven process can be labelled as “just-in-time learning” or “learning on demand”.
2. The web and its growing potential for immersive interactive learning environments orchestrated by institutionalized learning / teaching entities, be it regular education at the three levels. Its scope and nature is the support of curricular- and certificate driven learning; its agenda is to bring learners to the targeted expertise and competence in the most efficient way.

The main role of this report is to demonstrate and articulate how fundamentally different the two evolutions of ICT-supported L.L.L. across the two strands are. They have in common that both learning practices benefit from new ICT interactive and socially-connected measures all the time. And quite important for the European Commission the message that competitive forces are needed to vitalize L.L.L. in both strands bound to lead to a further acceleration of the process of translating innovation into marketable products and processes. As new products and processes are associated with new skill requirements, skill life cycles, too, have shortened and will decrease further in the future.

This process has resulted in skill requirements not being in sync anymore with the established working life cycles of individuals. Workers can to a much smaller extent rely on being able to market the skills they have acquired in the early stages of their life throughout their lifetime; rather, they have to constantly adapt their skills to the demands of the labour market. This means that distinctions between education and work are becoming increasingly blurred. This belief is behind the concepts of life-long learning and continuous training. Lifelong learning is defined, sensibly, by the European Commission as “all purposeful

learning activity, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence" (Scottish Executive, 2004).

Skills and knowledge are, of course, not only needed for participation in the labour market but also for non-economic activities, as the Commission's Memorandum on Lifelong Learning observes: There are "two equally important aims for lifelong learning: promoting active citizenship and promoting employability" (DiPrete, 2005). This means that skills and knowledge also fulfil an important role for quality of life in general (by allowing individuals to realise their full potential), and for the development of society (by fostering democracy, reducing the disparities and inequities among individuals and groups, and promoting cultural diversity). While the skills required in this respect might be less dependent on technology in comparison to economic activities, it is safe to say that the speed of change has increased in all aspects of daily life, which is at least partly a result, again, of the wide-spread implementation of ICTs (Gunkel, 2003). We can conclude with Castells (2001) that "if there is a consensus about the societal consequences of increased access to information it is that education and life-long learning become essential resources for work achievement and personal development".

Indeed, in recent years more and more stakeholders have realized that the potential merits of new ICT-supported learning open up a range of possibilities for meeting the growing demand for learning beyond formal educational organizations such as schools and universities; in short, for life-long learning. Moreover, both empirical evidence and practitioner reports confirm that institutionalized learning in the EU has adopted ICT infrastructures and applications widely. There is a broad consensus among policy-makers and researchers that formal educational organizations should prepare learners for life-long learning, and that their organizational structures should be made more supportive for this type of learning. Against this background, life-long learning and formal education should not be analyzed fully separately but rather considered as two components of an integrated system for enabling individuals to acquire relevant knowledge throughout all stages of their life. In the present report, both are analyzed in an integrated manner. The focus of the report is on recent, contemporary and emerging future impacts of ICT use on life-long learning. A better understanding of the impacts of ICT on society continues to be needed, indeed, for two main reasons: Firstly, traditional research methodologies have failed to get clear answers on the added value of ICT on learning effectiveness, as a recent overview of Cox & Marshall (2007) has shown. Secondly, ICT and the "Networked Society" are inextricably connected. Life-long learning seems to be more urgent than ever as networked societies both offer and need a swift generation and altruistic exchange of ideas.

Why is the impact of ICT on the practice of life-long learning of prime importance? If regular education covers around 30% of most European's life span, and if the largest part of national budgets is spent on education, why then focus on the learning after that period? Is it because we expect ICT not to penetrate regular education (Sánchez, 2008)? Or is it, as EU policy-makers seem to expect because ICT is affecting (continuous) life-long learning in particular? (CEC, 2008). In fact, our explanation is close to Mary Thorpe's statement: "Great that ICT penetrated school education, but now, will it affect life-long learning as well?" (Thorpe, 2005).

While focusing on the specific effects of ICT on life-long learning, the present report articulates that during its institutionalization, education has marginalized its ambition to stay a "learning organization". According to the report "Cross-Roads of the New Millennium; Proceedings of the Technological Education and National Development", (Elsner, 2000) it has become widely accepted that through ICT-based life-long learning, the focus of learning has been shifting away from teachers towards learners:

.... These changes in the structure of learning are being accompanied by changes in the patterns of work. Increasingly, individuals are being expected to act self-employed but be team players, and the concept of learning is being applied not only to individuals but also to teams, groups, and organizations. The following are some of the things that fully effective adult learners are able to do: audit and assess what they already know and can

do; formulate a career and learning development plan; integrate acknowledgment of their need for continuing personal development in private and professional realms into their learning; understand the qualities of different kinds of knowing and understanding, and of skills, and competence; and reflect on their knowledge and establish links between different kinds of knowledge. (Harman, 1990; Holmes, 2002)

Whereas school-based education has served the transition from feudal- into urban- and into industrialized societies. The very same structures of institutionalized education appear to obstruct effective life-long learning. Irrespective of the traditional schooling paradigm it should grasp its own opportunities and responsibilities for learning in the ICT era. Our approach to the analysis of ICT's impacts on education and learning is that ICT should be instrumental to learning; and learning itself should be instrumental to societal ambitions at a given moment in a given social context.

The a-priori question underlying this report is even more provocative: If ICT-enabled learning is adopted to its full extent, can it still be reconciled in ongoing institutional education anyway? Life-long learning nowadays still embodies the 20th centuries 'post-vocational learning' and rests upon the idea that during one's professional career life-long learning is just a matter of 'updating' one's prior learning. The more recent needs and potentials of life-long learning are to sustain the learning attitude as a default lifestyle in order to cope with an ever more changing and ever more intricate innovation in all thinkable sectors. In this sense, learning is not so much a sector; it is endemic to all aspects of life and society anyway.

As a conclusion: Learning has manifested as a much more diverse process and cannot be isolated from the societal ambition to allow a new generation to develop in unforeseen directions.

In this sense we hypothesize that ICT has a double role: to enable youngsters to express a unique identity as a reaction to adults' mindsets at that time. ICT calls for regular learning institutes to reconsider and adapt training content and methods to the much more volatile learning modes that youngsters deploy in today's personal media environments. In fact it asks educational systems to re-learn themselves; to become an agent in the transformation from institutionalized to existential learning. The discussion should be about the transformation speed which schools and the other parts of the educational system can afford. For non-formal learning this inertia plays a minor role, except that also here institutional players need to play a bigger role in the future.

It should be clear from these remarks already that the real impact of ICT on education and life-long learning cannot be understood from analysis of physical parameters – such as "percentage of schools with Internet access", "number of hours spent on the web" or "the number of URLs mentioned in study books" – alone. We need to look more closely at the different roles which applications of ICT play in the domain, and how they enable or even foster structural changes in the way Europeans acquire knowledge throughout their lives.

Moreover, we need to look not only at individuals but at communities, which can be seen as the prime context for learning. As a consequence it becomes clear that we cannot evaluate the added value of ICT for life-long learning in an isolated way; we need to take into account in how far society as a whole gains from it. And even we need to ask ourselves in how far society learns more effectively since the presence of ICT facilities. On our way to revalidate life-long learning in the scope of the networked society it is clear that we should not prune away the vital intertwined relationship between the two.

2 Epochal Trends and the Arrival of ICT in Life-Long Learning

2.1 The changing Understanding of Learning in Society

In general we need to distinguish two contrasting, however strongly-interrelated understandings of learning:

- Regular ‘school-based learning’: It implicitly targets convergence between learners. It rests upon predefined goals, -methods and prior assessment criteria. One could say that the essential learning momentum emerges in its curricular conception; the roll-out of a course is just a matter of transfer from those who know to those who don’t know yet. The epitome of this understanding has recently been formulated by Roger Hartley et. al, 2009.
- Life-long learning: the continuous day-to-day learning in the manifold situations during work and leisure time. Life-long learning is mainly driven by its situational and existential motivation. Quite often it has been labelled as “just-in-time” learning: the learner decides when prior knowledge fails and additional expertise is needed. Due to the fact that persons arrive at careers, jobs and finally need to be retrained, life-long learning is a vital process in preventing the person to suffer from adaptation rather than raise creative solutions and complement initial weaknesses.

To understand what ‘life-long learning’ means at present, it is necessary to question human learning in general. The present report addresses this aim by means of short review of what learning implies from a historical point of view. One important conception in this regard was that learning is to prepare oneself for entire life. Politically it was one of the few protections against having to join work from the earliest moment (Rousseau, 1762). In its romantic understanding learning was to address the essentials that prepare for the entire life: “long-life learning” rather than “life-long learning”. Thinking of the idea that “learning never stops” would have been hailed as a nightmare; how can you establish society if its members keep changing themselves?

However, change prevailed. And as we discern how the human species managed to cope with unforeseen situations (phylogeny) from the coping with changes, accommodation and learning in an individual’s life span (ontogeny), the load for ontogeny becomes heavier when humans create more cultural habitats, as phylogeny carries along fewer and fewer new solutions. On the one hand learning is the Lamarckian mechanism in order to make descendants to adopt what ancestors conquered already before (Egan, 2008). But what about what we than had to conquer for our descendants? Does this have to be fully arbitrary?

So, when by tradition we have accepted learning to be successful as it allowed persons to adapt to certain new situations, it is questionable if this definition satisfies in respect to the learning of society as a whole. The knowledge definition above does not hold for societies to learn from past history. Neither does it satisfy the convergence of learning of a new generation. School-based learning can very well be understood as the socializing process in order to make the young generation ‘compatible’ to the older one. In a class-based-, modal- and stratified society the school-based education makes sense in terms of Lamarckian transfer: Allow descendants to benefit from ancestors’ struggles.

The question is if learning in the postmodern networked society can still be envisaged as a convergence process. If not, how to imagine curricula, grouping the learners and how to define assessment criteria? Institutionalized education may become obsolete. However at the same time ‘life-long learning’ may be an ever more complex process to be orchestrated. Neil Postman (1986) in his “The End of Education: Redefining the Value of School” Postman suggests: “ ... that the current crisis in our educational system derives from its failure to

supply students with a translucent, unifying "narrative" like those that inspired earlier generations. Instead, today's schools promote the false "gods" of economic utility, consumerism, or ethnic separatism and resentment. Postman questions what alternative strategies can still be used to instil our children with a sense of global citizenship, healthy intellectual scepticism, etc."

Life-long learning in the epoch of the world-wide web can best be considered as permanent effort to let persons accomplish learning needs based upon continuous shifts in both the individuals' interest and the societal focus. Centralized efforts to accommodate such a delicate and transient process seem to have failed already. The Web with its potentials to make persons to find each other on any criterion like interest and ideology embody a good infrastructure for promoting learning in a non-centred networked society. Where ICT has provoked education to focus on informational resources, we may meet biochemical- and sleep technologies the coming years. The nature and culture of learning will work together more closely than we did in classrooms before.

The first important step towards clarifying and explaining past phenomena is to articulate clearly that except from monastic and early scholastic encyclopaedic idealism, learning has always been regarded as a means to achieve other "more important" goals like: divine contemplation, conquering enemies, progressive migration along social-economical strata and finally to extend existential and exotic ambitions like we see in the academic efforts given by the elderly after they finish their career in western countries nowadays. Learning as apprehended in the feudal and industrial times was instrumental rather than autonomous. Its goal diverted from the time when learning was seen as a process to change oneself. Once the intellectual aspect was reified, learning and education became a strategic tool to accomplish emancipation, industrial success etc. "Instruction" became the ultimate arrangement to make learning more focused and more efficient. In parallel to the influx of learning "technologies" political and social ideologies discovered "learning" as instrument to escape from inertia. Typical for both school-based and life-long learning is that it has transcended learning from its instrumental nature: Adapt in order to survive. Since the early 20th century learning has become a goal in itself. We may say that learning in its intellectual sense has become a cheap way to emulate the erudite-driven interest by those who were freed from material concerns like noble-, clergy men and academic scholars. Of course there is no way back; the romantic apprehension of learning as a complementary life-style can only flourish in a dual society of those who work versus those who think. In order to understand the dialectic nature of learning and societal development it is good to remind the early roots of "de-schooling society".

Already in the late sixties and seventies, the early precursor of the "networked society" arose. "De-schooling Society" is the epitome of reform pedagogies that had a critical stand on schooling institutes as mainly surviving for its own sake. As solution they promoted open knowledge sources and ubiquitous learning. ICT, and especially the web, has allowed citizens to access abundant information sources lately. Even the training of skills can be made via online games and simulations. Quite often it raises the idea that finally the web will bypass educational institutes. It would be too simplistic to say that ICT has enabled the process of "De-schooling Society" (Illich, 1971; Freire, 1972, 1995 and Reimer, 1971). At the other end it is fair to say that these authors would have been surprised to see that their apocalyptic forecast became so tangible within 35 years already. ICT has instigated learning to transform itself from *convergence* into a process of *divergence*. This can be seen in the informal-, non institutional-, non certificate-oriented aspects of learning that typically exhibit how the world *should* be understood. It is clear that the dominant textual format will be supplanted by complementary modalities like visual, voice, haptic and kinaesthetic sensations and expressions. A decisive factor is if the learner finds a way to satisfy him/herself after having mastered a certain mental goal. In terms if ICT support we might easily overlook the role of chocolate, drink coke or social talk for the overall pacing of the learner. Once these prime factors of pleasure work out in the awareness of the student, it is

hard to distinguish intrinsic from extrinsic motives during learning. The overall instructional approach focuses entirely on the external regulation. But in fact the crucial step is if learners manage to incorporate the external regulation into (internal) self regulation. Recently the role of internal speech in becoming an autonomous learner is considered more, (Agina, 2008).

Even if learners are fully dedicated to master a certain knowledge or skill, still many rituals on 'how to learn' can be observed. Research determined only very few basic mechanisms on how to learn best. At the same time we must admit that human learning manifests in hundreds of types of situations. Theories on how learning essentially works have been subject to a natural science discipline to find out the first order essentials when and how learning occurs. This has led to the many attempts to reduce the essentials of learning. The most dominant ones are mechanisms like contiguity between reinforcement and desired response, the role of motivation, variation in methods and environments, etc. In other words: there is a significant mismatch between the theoretical and the situational aspects of the nature of learning. The typical result of laboratory experiments is that learning theories have a strong emphasis on elementary types of learning: rote learning rather than meaningful, reproductive rather than productive, intellectual rather than emotional, social and creative learning. Its result is that ICT as learning support has by and large focused on practice-and-drill, hierarchical and task-analytical domains. The penetration of media of any kind has a pervasive effect on the way we suppose the human mind works best. Education itself has become a media genre on how to prepare the younger generation for real life best:

- The first stand is that we admit it is very hard to legitimate what content is most important to be taught.
- The second stand is to say that we just need any content in order to "learn to learn".
- The most ultimate stand is to say that learning should produce new understanding rather than just incorporate the one of yesterday.

Institutional (regular) education will increasingly struggle in balancing these three stands. Life-long learning in the sense of existentially-driven learning need have no problem in this sense; it is the learner's momentary motive to learn of to consult an existing expert. Still its main premise is that it is best to bring learners together in rather homogeneous groups and let them be taught *about the topics* by educationalists rather than by domain professionals. And again: It stays under the 'basic contract' that learning becomes more successful as it makes the learner more aware of the knowledge of the prior generation. As it is obvious that for life-long learning this premise does not work out, it is a challenging question on how regular education can make young learners sensitive for the more authentic and autonomous learning for life-long learning. If we see how web-based communities, in particular the 'communities of practice' enable large-scale learning among professionals, it becomes clear that ICT started to transform the learning culture drastically. The big question is: *If, when and how education will adopt these methods. When will it blend its "main contract" with the more rich practices of web-based life-long learning?* Traditionally teaching modes have been built upon the various ways of learning the domain of learning and on a priori learning concepts/paradigms (Kearsly, 2008). In spite of the trend from behaviourist via cognitivist to constructionist learning paradigms, education has managed to maintain its institutional nature.

The basic contract prescribes learners to incorporate what has already been mastered by the elder generation. Subsequently we see that "the new learning paradigms" have little or even detrimental effects on the innovation of education as a whole.

When comparing the systems of formal 'school-based education' with those for adult education and life-long learning, surprisingly enough it is the traditional institutional learning that has been subjected most clearly by this paradigm switch. Institutions for life-long (adult) education still embrace the transfer paradigm: Facilitating learners to assimilate predefined curricular content and skills. It is just the versatile non-institutional learning that has benefitted most from the potential of ICT through Web-based access to expertise and the

utilization of social networks and web-based communities. The mechanism of inertia towards preventing education to benefit from ICT can be seen most clearly in societies that adopted schooling cultures from abroad like the former colonial countries. It can even be observed quite strongly in a country like Japan that was forced to adopt the British schooling system via the American intervention in the late 19th and early 20th century. Exactly this enforced trend complicates its smooth gradual evolution. Most striking is that exactly Japan with its highly saturated and highly advanced technological infrastructure at the same time has a low penetration of ICT throughout education (Murata, 1990, 1993)

2.2 Changing Expectations about the Effects of ICT for Learning

The educational discourse has been strongly influenced by visions such as the one of technological support for learners, which were older than the use of computers in education. Skinner, 1971, for instance, envisioned “learning machines” as output-generating systems reacting on inputs. While teaching was seen as a pouring of knowledge (content) into the heads of the students, the “learning machine” had to control this effectively without wasting resources (time). Knowledge was here assumed to be a given element of a given canon, and learning a mechanical response to teaching: the learner was passive knowledge storage, the machine the active part.

This vision of the computer as a support of learners helping to focus their learning activities caused dystopian visions, as well. Some feared the related potential of the computer as an overwhelming power, total control of machines and brainwashing to be the result. Others on the contrary feared that the potential of learning programs to make appropriate sense of learner behaviour was too limited to benefit all diverse learning styles of students or pupils (there is some plausibility that it is not the range of technical tailorability of ICTs, but the time demands of related tailoring which in practice could form a related limitation).

In the 1990s, the Internet changed the notion of the computer and expectations regarding ICT and education fully. Education was no more only seen as a deliverance of selected content to be poured into the heads of students in appropriate doses, but as an opportunity for students to appropriate their future expert roles. In regard of ICT and learning, the automatization vision was replaced by a cooperation one. For example, computer-supported collaborative learning (CSCL) emerged as a new field, in which students should no longer be considered as mere consumers, but learn by practice about practice. Regarding adult education, the awareness of a growing need to engage more people in lifelong learning, and to increase the efficiency and effectiveness of learning activities, led experts to focus on the potential of ICT to make a real difference. There was the hope that ICTs could improve the process of learning and training, by giving easier access to more adequate learning content and more efficient learning techniques. It was understood that eLearning, in particular, would help meeting the challenge posed by the need for life-long learning. As life-long learners are understood to require personalized curriculums, individual guidance, and sophisticated and flexible delivery concepts for a new type of competence-focused learning experience which allows them to learn anything and anywhere:

Entire programs of study will be customized for the learner. By analyzing the learner's objectives and existing skill levels, courses will be assembled on the fly that address exactly what the learner needs to know without wasting time working on areas in which the learner is already proficient or uninterested. This level of personalization will be achieved by using small chunks of information, or learning objects, to assemble a course from the ground up using pre-existing templates. The reusability of these learning objects will make this level of customization feasible in terms of both time and expense. We believe that these reusable learning objects, the interoperability of which will be based on a set of accepted industry standards, will be the key to creation of an expansive learning economy. (Ruttenbur et al., 2000, p. 16)

Only by exploiting the networking potentials of ICT would it become possible to offer such services to large parts of the population. As a logical result, ICTs were expected to make

self-learning much more attractive to larger numbers of citizens. For these reasons it can hardly surprise that the Internet was often seen as an extremely powerful and important tool for self-directed learning. The following is a list of advantages which were usually ascribed to web-based forms of learning against traditional types of learning. Though the main trigger for developing eLearning was fascination and said to:

- Make learning resources and tools accessible anytime, anywhere. It is therefore optimally suited for a world of flexible e-work, distributed organisations, and the “24-hour-society”;
- Eliminate travel expenses;
- Give just-in-time access to timely information;
- Allow content to be updated quickly and centrally – a key advantage over off-line electronic training material such as CD-ROMs;
- Empower the learner by means of personalised learning (learner-controlled, self-paced) – enabled by modularity of presentation; higher retention of content is the likely result;
- Provide true interactivity and simulations of real-world events which can increase learner's motivation;
- Improve collaboration and interactivity among students;
- Be less intimidating than instructor-led training – students can try new things and make mistakes without exposing themselves;
- Allow providers to directly measure the effectiveness of training programmes in a way that was never possible before;
- Give advanced possibilities for management and control of the learning process.

These advantages explain why eLearning was expected to contribute considerably to the provision of learning and training to individuals who are in risk of being left behind by the developing information society. This was formulated well by an EU group of expert stakeholders on ICT and social and employment aspects, which stressed in a report on e-Inclusion²:

e-Learning can make a major impact for social inclusion. It provides access to education and training opportunities for all, in particular for those who have access problems for social, economic, geographic or other reasons. ICT offers possibilities of transforming the learning paradigm and bringing knowledge to those who have not earlier been able to participate in education. eLearning can also play a significant role in implementing the concept of flexible and individualised learning, answering individual education needs, and avoiding the limitations of current systems, based mainly on pre-defined options.

In this sense, the main objective of policies that try to foster eLearning is less, therefore, to substitute for less efficient or more costly types of learning, but rather to **increase the overall amount of participation in learning**.

In the context of vocational training, a concept which is still discussed widely is “just-in-time training”, which is understood to mark a shift away from the just-in-case approach which was the basis for traditional vocational training. In 1996, just-in-time training was described by two of its proponents as follows:

Just in time training is delivered to the learner as soon as possible after a learner has identified a specific training need, and the shortest possible time before a learner needs to use the skill and knowledge outcomes of the training. JITT is concerned with getting the right training to the learner when, where and how they want it. The main feature is that the training is appropriate and delivered in a timely manner. The rapid development of educational computing and telecommunications technology is quickly increasing our ability to deliver just in time training. The wealth of training content and courses around the world

² CEC (2003)

will soon be able to be accessed much more easily through the use of this technology. Multimedia content can be delivered to remote locations via an online service, CD-ROMs, or diskettes. Video, audio and data conferencing can be used to deliver training to learners in remote locations. Online tutors and helpdesk service can be used to provide answers to questions and enquires. (Ross & Merakovsky, 1996)

Rapid diffusion of computer networks, in later years mainly the Internet, also gave rise to discussion about the expected wider impacts on Europe's education systems. Initially persons mesmerized once they become alerted by the vast amount of information they can open via the Web: be it professional-, entertainment or ideological information, both local and global sources for extending our understanding, taking decisions, finding experts etc. It leads to questions like: What conceptual frameworks, ambitions and search skills are needed in order to benefit from those sources? It may lead to the question "what do we still need to learn, if all this information is at the tip of your finger?" One step further is if and how we can learn from this information access; can we enlarge our professional and existential scope through being supported by having access to these almost infinite residues of human expertise on the web? As information access becomes so ubiquitous the questions may arise: "Do we still need to learn?" and "Should we assess learning outcomes while the learner is amputated from information resources when in daily life information access is abundant?" The notion of 'distributed cognition' has been coined to assert that in every-day life the expertise is between rather than in persons. So why not prelude on the new collaborative skills in educational settings as well? (Salomon, 1993, 1997; Brown et al., 1993; Dror, 2008; Hutschins, 1995; Norman, 1993; Perry, 2003 and Zhang, 1994).

Looking back at the history of ICT implementation in the education domain, it seems quite hard to find technological novelties that have *not* been allowed to demonstrate how they could add value in education. Even, we have seen that typically the field of learning and education has been chosen to demonstrate the sophistication of new media applications like "intelligent (tutoring) dialogues", "simulations", "knowledge representation methods like concept mapping", "collaborative multi-user software", "interactive video", "mobile/ubiquitous computing", "virtual reality", "podcasting" and now also "web-based learning networks". The intriguing question is then not so much *if* ICT is used in education; it is the question *how* ICT is used and if its potentials to contribute to the essence of learning are targeted. In other words: To what extent is ICT accepted as catalyst for transforming traditional learning into the new ones that fit in the needs of the Network Society (Krumsvik, 2009)? It appears that ICT is being held back from realising its full potential in education, not because of technological or functional deficits, but because of an essential mismatch between the paradigm of institutionalized learning (the transfer paradigm) and the newer notion that learning can only be effective if learners become involved in the process of knowledge (re)creation.

2.3 **Changing Skill Requirements on the Labour Market**

Skill needs on EU labour markets have undergone comprehensive changes in recent decades against the background of economic restructuring and the rise of the network society (Castells, 2001). In the advanced capitalist countries, the main 'impact' has been to substitute capital (often in the form of ICT equipment) for labour. But contrary to earlier fears that this development would lead to mass unemployment, it appears that people are still needed for tasks for which computers are ill-suited. According to the influential work of Levy & Murnane (2004), the main characteristic of such jobs is that they require **complex pattern recognition**. Such complex pattern recognition is at the core of **expert thinking** and **complex communication**, two of the key meta-skills which Levy & Murnane identify as being of increasing importance in the knowledge-based economy and society:

- "Expert thinking: solving problems for which there are no rule-based solutions. [...] By definition, these are not tasks computers can be programmed to do. While computers

cannot substitute for humans in these tasks, they can complement humans in performing them by making information more readily available”;

- “Complex communication: interacting with humans to acquire information, to explain it, or to persuade others of its implications for action.”

On the other hand, skills in doing things which computers are better at than humans – basically, those based on clear rules³ – are becoming less valuable.

Manuel Castells (2001, p. 91) states that the most important objectives of the learning process have become “first, learning how to learn, since most specific information is likely to become obsolete in a few years [...]”; secondly, having the ability to transform the information obtained from the learning process into specific [operationally valuable] knowledge”. In this context, and with regard to the labour process, he speaks of the need for “self-programmable labour”.

Facing the need to define in more depth the competences required for full participation in the knowledge-based economy, Felistead et al. (2002), through In-depth analysis of the UK Work Skills Surveys, identified ten categories of generic skills and how these can be operationalised. In Table 1 the relevance of each of these ten skill categories for computer-mediated communication and interaction is discussed in brief.

Table 1: Skills categories of particular relevance for the Knowledge-based Economy & Society

Skills category	Description	Relevance for Employment in the Knowledge-Based Economy
Literacy Skills	Both reading and writing forms, notices, memos, signs, letters, short and long documents etc.	Essential because of the increasing dependence on text-based information.
Physical Skills	The use of physical strength and/or stamina	Low relevance.
Number Skills	Adding, subtracting, divisions, decimal point or fraction, calculations etc., and/or more advanced maths or statistical procedures	Increasing importance for interpreting and processing computer-generated information
Technical ‘Know-How’	Knowing how to use tools or equipment or machinery, knowing about products and services, specialist knowledge and/or skill in using one’s hands.	Technical knowledge of computers remains important. The degree to which specialist know-how is needed is, however, dependent on whether and how the supply-side will make progress in usability.
High-level Communication	Top-down communication skills, including persuading or influencing others, instructing, training or teaching people, making speeches or presentations and writing long reports. This skill is also linked to the importance of analysing complex problems in depth.	Relevant as increasing shares of workers are asked to carry out management tasks.
Client Communication	Selling a product or service, counselling or caring for customers or clients.	Relevant as increasing shares of workers have to communicate with customers.
Horizontal Communication	Working with a team of people, listening carefully to colleagues.	High relevance and interrelation with “technical know-how”
Planning	Planning activities, organising one’s own time and thinking ahead.	Very high relevance (cp. Castell’s notion of “self-programmable labour”)
Problem-Solving	Detecting, diagnosing, analysing and resolving problems	High relevance as responsibility is distributed more evenly across workers of all ranks.

³ “Computers’ comparative advantage over people lies in tasks that can be described using rules-based logic: Step-by-step procedures with an action described for every contingency” (Levy & Murnane 2004: 16).

Skills category	Description	Relevance for Employment in the Knowledge-Based Economy
Checking Skills	Noticing and checking for errors.	High relevance as responsibility is distributed more evenly across workers of all ranks.

Source: Gareis, 2006

2.4 The Discussion on Life-Long Learning

The dispute on whether next-future society needs individual- versus collectivistic mentality capacity like problem solving or creative design is hard and cannot escape from extrapolating the recent research into distributed cognition (Salomon & Perkins, 1989). Its underlying theory is the "Transfer of Learning". While formerly, analysis of education systems and rates of participation in education and training were concerned only with the formal education system and the systems for what is called non-formal education and informal learning (ISCED definitions) (all of these are limited to structured and purposeful learning processes), in recent years, a number of authors have suggested that rather than these, it is actually incidental (experiential) learning which is the most important way in which people acquire skills. This implied that such learning is capable in theory to fulfil a similar function as more formal learning activities e.g. in courses (cf. Dohmen, 2001 and Tuomi, 2006). The main obstacle to recognition of incidental learning is seen as the lack of accreditation, which means that skills are usually only acknowledged and rewarded on the labour market if they have been acquired through formal education activities.

This brings up an essential question for the debate around lifelong learning: If it is correct that incidental learning is more important than learning in more formal settings, does this imply that efforts which aim to increase adults' participation in training courses and other structured and intentional learning activities should be abandoned, and that policy should rather concentrate on boosting chances of people to acquire knowledge through experience (such as "learning by doing" on the job). Some evidence indeed suggests that incidental learning has a significant role to play in skill acquisition:

- In Germany, the "Berichtssystem Weiterbildung" reports that three out of four persons in employment state to learn informally for their job (BMBF, 2003).
- Data from the eBusiness Watch surveys shows that enterprises regard "learning on the job" clearly as the most important way to develop IT skills in the company. About 60% of enterprises say that "learning on the job" is "very important", much more than in the case of formal training schemes. This confirms results from the BISER survey targeted at workers.⁴
- Livingstone, who conducted the first Canadian national survey on adults' informal learning practices, found that adult Canadians spend on average 15 hours per week on informal learning (most of which related to paid or unpaid work), in addition to 4 hours per week spent on average on participation in training courses. About 95% of the adult Canadians were involved in some form of adult learning which they can identify as such (Livingstone, 2001).

In spite of these findings, most research suggests that we must be doubtful about the ability of experiential learning to prepare people for change (as opposed to coping with change) – something which has become vitally important in times when we all need to adapt much quicker to the ever-changing socio-economic environment. There is a wide-spread perception of lack of skills among workers as well as among employers – which seems to imply that even if the large majority carries out incidental learning, it appears not to be able to meet all skill needs. Anecdotal evidence would also suggest that more formal, purposeful

⁴ See <http://www.ebusiness-watch.org/>; www.biser-eu.com.

learning, especially if it yields a form of certification, provides benefits in the form of higher self-esteem and motivation.

Therefore, we must conclude from the research into incidental learning that working (and living) in an environment which is rich in experience (for example having a computer workplace with access to the Internet) has a major influence on the amount of skills a person is likely to acquire, regardless of the extent of taught learning they are involved in. The potential of ICTs for transforming the acquisition of knowledge and skills is, therefore, likely not to be limited to intentional and structured processes of education and training.

Therefore, the notion of life-long learning has split into two domains mainly:

- Life-long learning that obeys the law of the “overall contract” in the sense that those who want to learn need to open the mind for those who pretend to know already. A clear example is the “Éducation Permanente” and life-long learning as a repair of lost schooling chances.
- Life-long learning as an effort to see learning as endemic to life anyway. It acknowledges learning to be an intrinsic need and desire that cannot be orchestrated by third parties. It is just this second notion of life-long learning that benefits ultimately from ICT. It comes close to the notion that “learning has disappeared as it is always there”.

3 Applications of ICT in Life-Long Learning

Schools and training institutes are saturated by ICT infrastructure nowadays: Distance learning, blended learning, web-based learning support systems. In fact it has become difficult to remember the situation from before the arrival of the Web, not to talk about the situations from before the arrival of the PC.

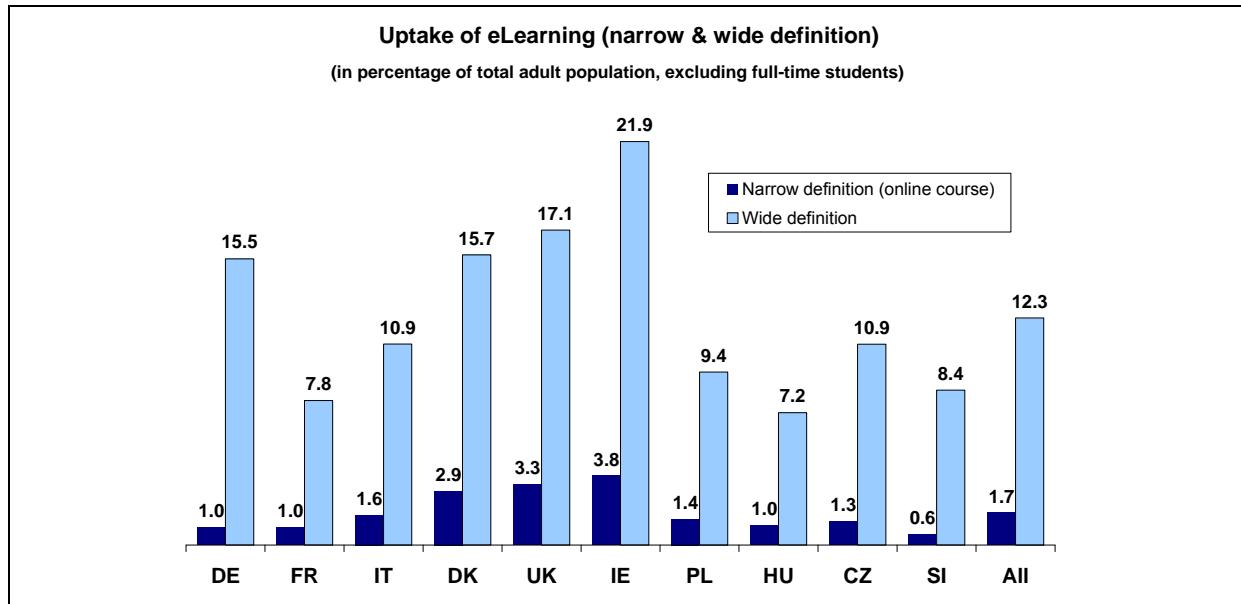
3.1 eLearning Forms

With regard to remote education and training, two modes are generally to be distinguished:

- **Internet-enhanced training and education**, where the learner has opportunities to meet face-to-face with the instructor. Often, online delivery of training is supplementary here (and generally subordinate to) traditional face-to-face classes. It may replace materials previously delivered to students through the mail or handed out in person. Internet-based segments of the training are typically asynchronous, implemented through either a web editor or an asynchronous course management system.
- **Internet-delivered training and education**, where the learner is never (or very rarely) in physical proximity to the instructor. This is in some ways a successor to “distance education⁵”, “correspondence courses” or “distance learning”. Instructor-led traditional classroom sessions are either eliminated, adjusted for some different form of asynchronous interaction, or replaced with real-time “virtual classrooms”.

The 2005 **eUSER survey** demonstrated that eLearning is not widespread in Europe yet, if eLearners are defined as those who have taken an online training course in the 12 months prior to the survey (“narrow definition”, see Figure 1). However, using a wider definition, which includes all those who are using the Internet in the context of purposeful learning activities, the spread of eLearning had reached a significant share of the adult population in 2005 already.

⁵ Distance education is defined by Verduin & Clark (1991: p. 8) as “any formal approach to learning in which a majority of the instruction occurs while educator and learner are at a distance from one another”.

Figure 1: Uptake of eLearning (narrow and wide definition) – by country, 2005 (in %)

Source: eUSER (2005b)

Jackson (2003) distinguishes between types of eLearning according to the degree to which the Internet complements existing learning activities as opposed to learning which takes place only because the Internet has made access to training services easier:

- Course sharing – using technology to share a scarce resource (instructor) among geographically disbursed learners in order to create economic economies of scale. Typically, the learner audience will be comprised of multiple groups of traditional on-site learners gathered together in an electronically-facilitated group setting and may often involve a proctor/site coordinator that may enhance the group educational content with local customisation.
- Non-traditional audiences – using technology to deliver courses or programs to learning constituencies that would not typically attend a traditional on-site course. The focus of this subcategory is creation or sustaining of new, non-typical or underserved audiences (for instance: working adults, homebound caregivers, disabled, “homeschoolers”, military, special education, etc.).

These two subcategories are important to appreciate because training provider and learner needs, pedagogical issues, and infrastructure designs may differ dramatically between them.

A general classification used by the eLearning industry is the following (Ruttenbur et al., 2000):

- **Synchronous Shared Learning (SSL):** This is the online version of the traditional classroom learning experience. Communication between the instructor and the students – all located at a distance – takes place in real time over the Internet. SSL normally takes place in the context of a collaborative Web environment, and involves technologies such as registration, one-way video, one- or two-way audio, application sharing, slide presentation, white-boarding, hand raise feature, web touring, chat, testing, tracking and access to archived sessions. SSL offers one of the main advantages of eLearning, namely access at a distance, but does not deliver freedom for time constraints since learners need to take the session when these are given, rather than when it is convenient for them. More frequent, thus, are the following two formats for eLearning.
- **Asynchronous Shared Learning (ASL):** Here, the learning experience can take place at any time with the help of archived reading material, audio and video clips etc.

Collaboration is limited in comparison to the SSL model, but asynchronous media (e-mail, discussion forums) can be used for this purpose. However, the learning experience involves guidance and feedback from an instructor, and forming a “class” together with other learners. Technical elements typically include registration, progress tracking, threaded discussions, simulation exercises, and testing. Moreover, multimedia capabilities are more important than in SSL because the learner is in greater need for motivation.

- **Independent eLearning (IEL):** IEL means that learners are on their own – they are not participating in a shared learning experience, but make use of Internet-delivered content and services in order to train themselves, which might be whenever time allows. The absence of an instructor means that IEL depends more on an automated eLearning system which tailors the learning experience according to the capabilities and preferences of the learner. Highly customised courses are possible, but their performance depends on effective and thoroughly tested eLearning applications. Pre-assessment tools are very important here, as is multimedia content and sophisticated feedback which emulates the experience with a real world instructor.

Due to the shift towards the knowledge-intensive economy and society, a new set of learning paradigms have gained acceptance in recent decades, including:

- **Embedded, problem-based and learning by doing**, the main contribution of which is the acknowledgement that learning in isolation makes application in real life situations unnecessarily problematic (Kommers et al., 2004).
- **Distributed cognition** is the notion that human expertise manifests between- rather than in persons. Many jobs demand team work and rely on several disciplines to merge before optimal solutions can be reached.
- **Collaborative- and constructivist learning methods** have complemented the instructional repertoire. It implies a sharper focus on learning competences rather than ‘following’ predefined curricula. The core idea in constructivist learning is that understanding and application of skills and complex conceptual domains need a highly active and individualized process or mastery. Subsequently the role of the instructor differentiates in subject matter expert, diagnostic coach and facilitator. Cognitive learning tools are indispensable in this regard (Mayes, 1992).
- **Blended learning**, based on the fact that both face-to-face and remote presence is needed in order to offer flexibility to the learner and its coach. Instead of uniform assessments the situation of blended learning will be evaluated with a learner’s unique portfolio that demonstrates all competencies required in order to function adequately in a certain professional layer; (Gierke, 2003; Oliver, 2005; Reinmann-Rothmeier, 2003; Rossett, 2003 and Valiathan, 2002)

Blended learning comprises the combination of e-learning with all existing formats for instruction and education. The key asset for blended learning is the comfort of distributing, the mix of communication strategies, didactic strategies and kinds of learning environments in respect of various types of learning processes. In fact, blended learning can be seen as the ultimate synergy among all diverse learning ingredients and support methods, similar to what has been the case in pragmatic learning scenarios for a long time. Only as now the web with its (a)synchronous interaction modes offers new options, again blended learning gets a new image anyway. For L.L.L. this perspective opens vast new opportunities like the more subtle combinations of work, playing and learning. The intersections among the playing and the work and the playing and the learning still need to be explored further.

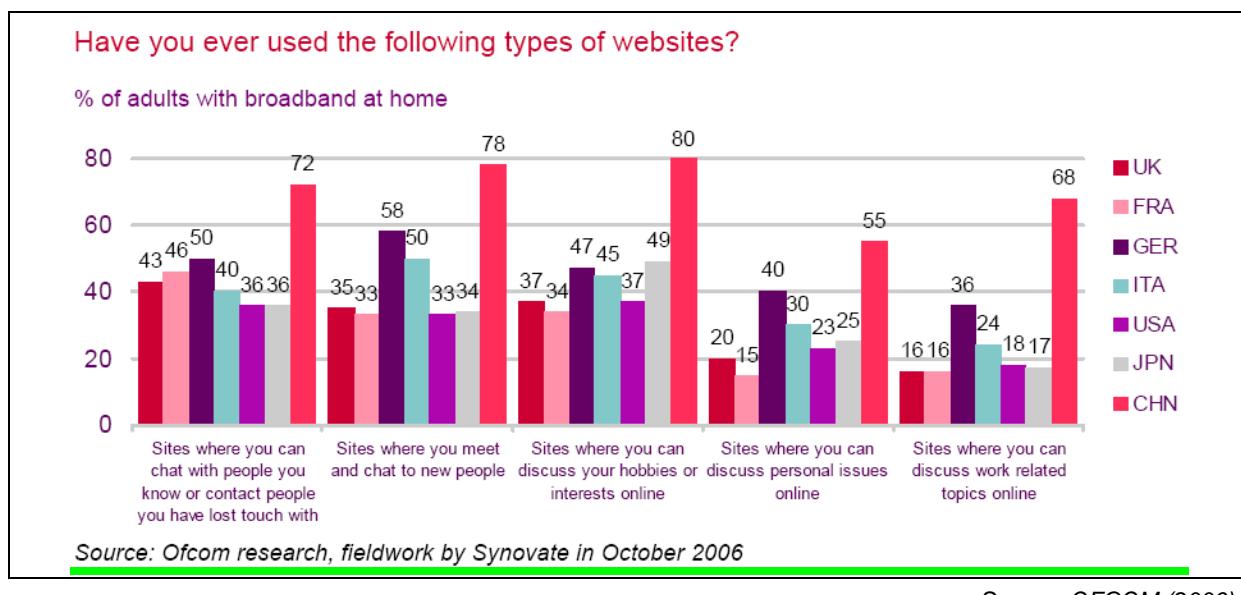
3.2 Web-based Learning Communities

Since the early 20th century it has been recognized that learning is essentially a communicative- and thus a social process; Vygotsky, “Thought and Language, 1934”. See

also Wertsch (1985). Communities are the prime context for learning; therefore education cannot measure its success at purely intellectual or cultural criteria. A better benchmark is to ask if education and life-long learning meets the criteria of the envisaged network society. We cannot evaluate the added value of ICT for life-long learning in an isolated way; we need to take into account in how far society as a whole gains from it. And we also need to explore in how far society learns more effectively since the presence of ICT facilities.

"Web-based communities" have been signalled as ultimate agglomerations where joint interests and sharing understanding fuel a phenomenon called "just-in-time learning". A sceptic view is that in this way the omnipresence of free consult in fact inhibits rather than promotes learning; If expertise is one click away it is not likely that community members may hesitate to invest in learning to solve the problem themselves. Communities of Practice heavily rely on a combination of the best available technologies nowadays: Mobile, ubiquitous, collaborative, constructivist and virtual reality for optimizing colleagues to complement each other's knowledge and experience. CoPs, "Communities of Practice" rest upon the notion of distributed cognition (Salomon, 1993) that allows professionals to instantly benefit from each other knowledge and experiences. Lave and Wenger studied the relation between enculturation in collaborative environments such as midwives and sailors, where they identified the CoP. It was only later that this form of learning was also detected in ICT-mediated communities. (Wenger, McDermott & Snyder, 2002). An academic question that arises here is if this mechanism of peer consult 'promotes' or 'bypasses' learning essentially? The arrival of the Web 2.0 has opened the awareness that web functionality finally need to support human and social functions. However the penetration of the actually needed knowhow should not be overestimated as can be seen in Figure 2 below.

Figure 2: Use of different types of social networking sites, 2006

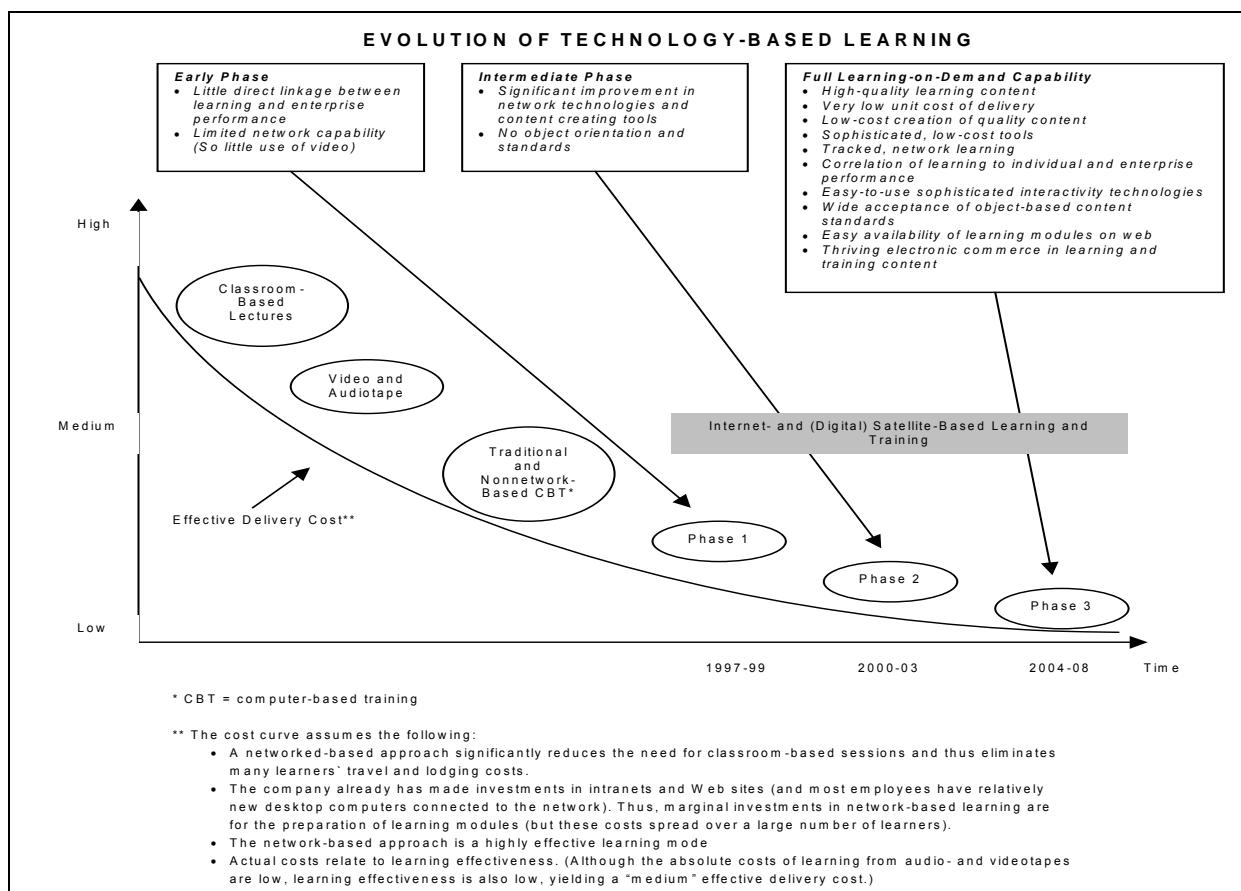


Redecker et al. (2009) investigated how social computing applications can be used in organised learning settings in order to enhance learning activities. They propose a triangulation of different research methodologies. It reveals that Learning 2.0 approaches can facilitate technological, pedagogical and organisational innovation in Education and Training and thus contribute to the modernisation of European Education and Training institutions deemed necessary to face the challenges of the 21st century.

3.3 Overall Levels of ICT Diffusion in the Education Domain

In upper Secondary Education we find that it is 1.7 pupils per PC and for the first time in we see now Secondary School where students have their personal laptop in front of them throughout any of the lessons. 41% of these pupils are using five hours or more every day in front of a screen (PC or TV) in their leisure time outside school. For the elementary pupils (9–16 age group) the tendency is the same and digital learning resources are increasingly replacing textbooks for homework (SAFT, 2006). 88% of 10-years old kids and 99,4% of 16-years old youngsters got their own mobile telephone (Telenor, 2007). Few previous studies showed that ICT had had little demonstrable effect on young people's learning, so there is reason to be sceptical of simple conclusions in this regard (Cuban, 2001). At the same time we are seeing the digital revolution and the massive trans-contextual use of media by young people paving the way for different, indirect approaches to learning under the previous curriculum (the 10-year comprehensive education curriculum). In other words: The added value for traditional learning practices is limited and hard to assess. The more urgent question is to what extent technology-based learning will transform traditional- into the type of learning that fits the coming networked society.

Figure 3: Evolution of Technology-Based Learning



Source: SRI Consulting, quoted in Ruttenbur et al. (2000, p. 78)

Media use in formal education is often used to reduce bureaucratic procedures such as informing students, collecting homework, or organizing tests. This enabled students to select courses or home work from home and educators to engage themselves in calmer time slots. ...

In order to understand how ICT has affected learning practices it is important to know that throughout the evolution of ICT we cannot find back any clear 'demand factor' from the side

of education. As resumed earlier in this report, indeed the field of learning was an attractive test field for new challenging ICT methods. Good examples are the early dialog generators (Eliza and the authoring systems stemming from it). But it was purely the technological fascination that these early prototypes were welcomed in the field of learning. The same is the case for simulations, knowledge- and reasoning support, content management systems etc. The type of application that survived after twenty years is not the most challenging; it is the learning support system like Blackboard and its open source competitors like Moodle and Sakai. Its main rationale is that learners learning processes need to be scaffold; like divide and conquer, test-driven deadlines, and recently the trend to demand for students' portfolios; its main idea is that learner need to learn from their own learning process, by reflection, documentation, reconstruction and meta learning. In fact precisely this element of "learning to learn" seems to be the genuine value that is enabled ICT. Much more visible, but in fact much less essential, is the large scale invasion of ELSSs "Electronic Learning Support Systems"; in essence they emulate the roster, the blackboard and the exercise book. These ELSSs are a good example of the pushing mechanisms of ICT that graft generic data managing facilities on the more specific application area like Education. In the field of education, no demand for such logistic support tools has been expressed. It is just the fact that they are available from the wide field of administrative systems that causes them to become default solutions for such a dedicated area as learning and teaching.

Why has education accepted this role of being submissive to what technology had to offer at that moment instead of having taken the lead in defining what a better learning would need in terms of technology? There are two answers:

- There have been numerous representatives from education who took sometimes an architectural and sometimes a researcher position. Patrick Suppes is one of the more renown; See his works in the time frame 1959-1999⁶.
- Typical for those early ambassadors is that they took a pioneering stand and they were rather insensitive to the real constraints of applying their ICT prototypes at a larger scale. In fact we can say that they lost their prime role of representing the educational field.
- The main inhibiting factor that withdraws education to be the concept designer for how media-based learning could really improve current practices is the fact that education is tight to the "overall contract". This contract is that some-one who wants to learn, (s)he needs to comply with the way experts handle topics. This may look as the inevitable paradigm for learning: but it is not. It is just the consequence of learning to be encapsulated in institutes who just have the job to make the learners to learn. Complementary there is the role of the teacher as representing the expert, who can only survive if (s)he stays in the role to teach, to test and to testify that a certain student has shown the needed competences. ICT in this overall contract will only flourish if it is perfectly in line with the same overall contract. Examples of ICT learning support programs are the many collaborative tools for allowing students to negotiate topics, concepts and problem approaches. The overall contract prescribes that learners need to comply with the expert solutions. So why lose time by exploring different directions? For the majority of ICT learning tools we see broad institutional administrative systems. Its goal is to standardize learning events, tests, grading etc.

This second factor illustrates that ICT in the sense of administrative learning support systems has fully been adopted by the large European schooling institutes nowadays. Arguably, educational institutes tend to adopt ICT measures mainly in order to preserve its "main contract": Learners are supposed to learn what has been defined as valid by authorities before.

⁶ See <http://www.stanford.edu/~psuppes/education.html>

4 Social Impact Analysis

For an analysis of the “Social Impacts of ICT”, the sector of Education and Learning is highly relevant as this domain reflects the way society utilised ICT to prepare for the future. The present study starts from the fact that education and learning have become a major factor in societal awareness. We see that ICT has entered our schools and has sped up earlier trends towards adaptation and differentiation, but many scholars argue that it has been weak in re-establishing a balance between, for instance, expository, problem based, and collaborative learning (Dekker et al., 2004a, 2004b). One key question here is if the entrance of ICT has shown its own agenda; in how far has it been an autonomous factor? Being in the middle of this process it is not easy to see where cosmetic effects gradually become a transformation or even an evolutionary change. What indicators are there at the moment that would allow us to estimate the direction and the magnitude of life-long learning via the Web?

4.1 Rationalization

Data from the Eurobarometer 241 indicate that “Following an Online Course” or other functions related to learning is a frequent activity carried out via the Internet: 35% of EU Internet users report that they have done so already). The figure is considerably higher in some countries, including Lithuania and Finland (55% and 50%, respectively). The Internet is also a major source for information about education and training offers. The 2008 TRANSFORM survey⁷ found that for those who got additional education or training for their career (48% of the total sample), the Internet played an essential role for one out of four, and an important role for one out of two persons (see Table 2).

Table 2: The role of the Internet for learning-related life decisions (TRANSFORM findings)

	Percent of Internet users who dealt with this issue in last 3 years	Percent of those who dealt with issue for which Internet played an essential role ⁸	Percent of those who dealt with issue for which Internet played an important role ⁹	Importance of the Internet for dealing with issue: Mean on 10-point scale
Gotten additional education or training for your career	48.4	25.3	51.7	4.27
Chosen a school or college for yourself or your child	32.9	28.4	53.6	4.25

Source: TRANSFORM (2008, p. 65)

Figures are similar in the case of having to choose a school or college for oneself or a child.

4.2 User orientation

A useful concept for the purpose of assessing the impacts of ICT on life-long learning is the notion of ‘user orientation’. The eUSER study conceptualised the dimensions of user orientation in the context of online learning services. According to the study, a lack of user orientation of learning-related services is likely to lead to learning and training:

⁷ The TRANSFORM regional population survey was conducted in late 2007/early 2008. Data collection was designed as an Internet user survey with the universe set as the total online population aged 18-64 in twelve EU NUTS 2 regions: Poland: (a) Pomorskie, (b) Malopolskie; Slovakia: (a) Bratislavsky Kraj, (b) Vychodne Slovensko; Germany: (a) Schleswig-Holstein, (b) Thüringen; Sweden: Mellersta Norrland; Italy: Emilia-Romagna; Spain: (a) Navarra, (b) Extremadura; UK: (a) South Yorkshire, (b) East Anglia. Sample size: At least 300 successful interviews per region, except Slovakia: 200 interviews per region. Total sample size: 3588

⁸ Value “1” on 10-point scale (1 = essential, 10 = not important at all)

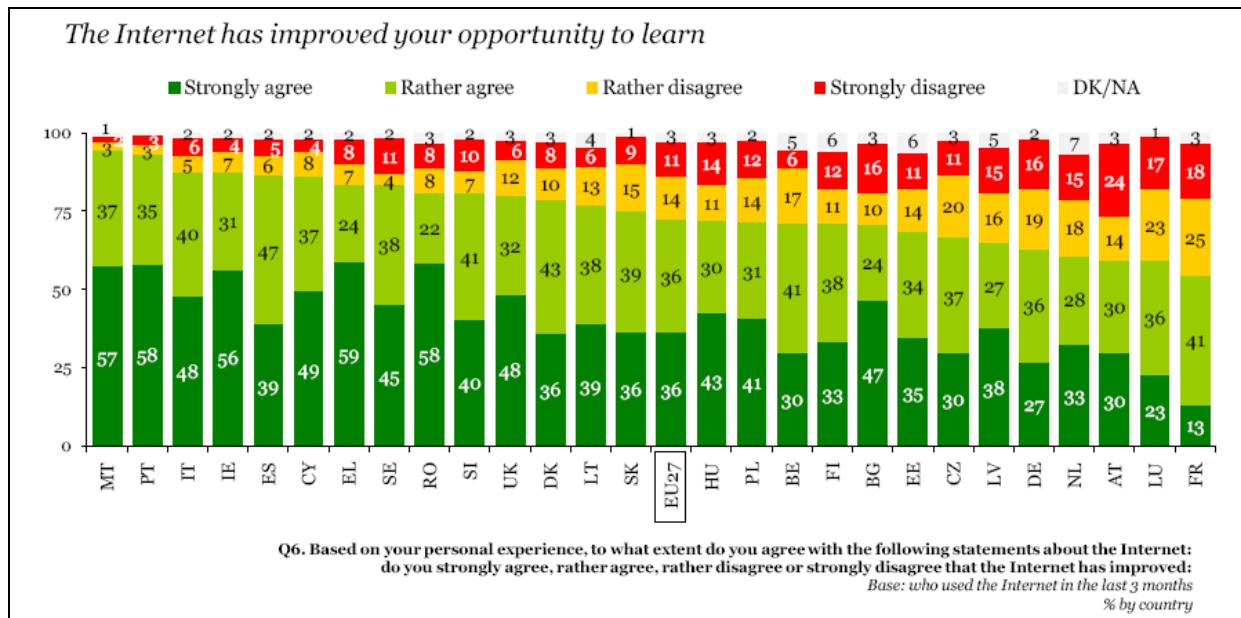
⁹ Values “1” to “3” on 10-point scale (1 = essential, 10 = not important at all)

- taking place in inefficient ways, which means that resources are wasted (e.g. working and leisure time of the learners; HR investments of companies) – **inefficiency**;
- not achieving the intended results, i.e. the amount or quality of the skills obtained are less than expected, and may be insufficient for the tasks ahead – **ineffectiveness** or **learning failure**;
- leading to frustration on the side of the learners which may result in diminishing willingness to get involved in learning activities again; this would contradict the policy goal of continuous lifelong learning – **learning fatigue**;
- not taking place at all because potential learners are put off by their expectations concerning costs and benefits of participation – **non-participation**;
- not reaching those who have a negative attitude to adult learning from the very start – **non-**

Against this background, to what extent can ICT contribute in order to make lifelong learning more effective, and as a likely consequence, also more attractive to people currently not engaged in adult learning?

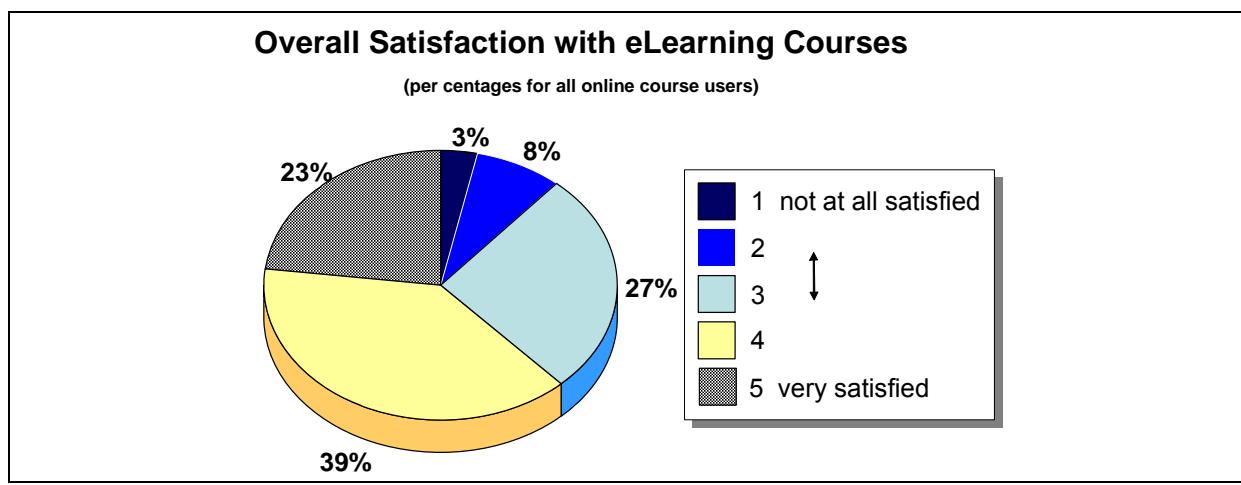
Indeed, analysis of data from the 2003 **PISA surveys** (OECD, 2005) suggests that the mathematics performance of students without access to computers at home was significantly below that of those with home access to computers (cf. OECD, 2008a, p. 22). This difference was found to be significant for all countries covered by the study. In 23 out of the 31 countries in the study, a performance advantage (albeit a lower one) persisted even after accounting for different socioeconomic backgrounds of students. The performance difference associated with school access to computers is less pronounced, although it is high in the United States, Canada and the Czech Republic. Additional findings suggest that students with shorter experience in using computers and those who use them least at home scored below average in mathematics. The highest performances in both mathematics and reading tended to be from students with a medium level of computer use. The authors conclude from the last finding that excessive computer use could have a negative impact on school performance.

The data from **Eurobarometer 241** indicate that the share of European Internet users who perceive that the Internet has made it easier for them to engage in learning activities is significant, indeed: 36% strongly agree that opportunities for learning have improved, and an additional 36% ‘rather agree’ to this statement. This means that the effect on learning opportunities is among the most widely perceived effects of the Internet on users’ daily life. Moreover, perceptions of positive effects are not limited to frequent Internet users only (cf. Gallup 2008, p. 28). As Figure 4 shows, the differences in the estimation on how far the web has facilitated learning across European countries are considerable.

Figure 4: Perceived effect of Internet use on opportunity to learn, % of all Internet users

Source: The Gallup Organization (2008, p. 30); Data source: Flash Eurobarometer 241

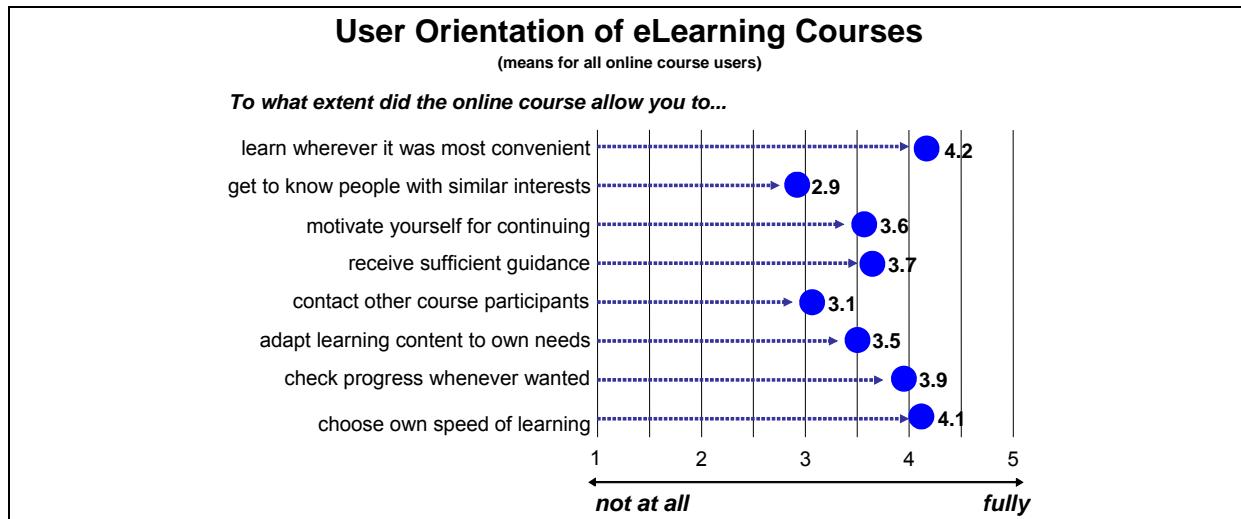
As global trend we may conclude that those countries, whose population has a longer experience with internet applications, tend to develop a bit less optimistic opinion on how it contributed to their learning. With regard to perceived user orientation of eLearning courses, data from the eUSER survey showed that a large majority of those who have taken an online eLearning course are satisfied with what they got from the service(s) they used (Figure 5). They overwhelmingly reported good usability and user orientation of their online courses when asked about aspects such as: ability to learn at whatever place they found most convenient; ability to choose own speed of learning; possibility to check learning progress whenever wanted; ease of interface use; comprehensibility; and extent to which content is well organised.

Figure 5: Overall satisfaction with eLearning courses among users

Factors that are rated, on average, as least satisfactory are possibilities for personal interaction with co-learners and teachers/tutors and capability of the eLearning service to motivate for continuing with the course (Figure 6) – suggesting that the social aspect of learning is diminished when it is done mainly online – even if most existing online courses

appear to include elements of “blended learning”. Where being practised, blended solutions seem not always to work well in terms of providing both a sufficient social dimension and the benefits of the eLearning aspects. This appears to be a major barrier to take-up, as the majority of would-be lifelong learners consider the social side of learning-related activities as important: more than two out of three respondents state that the possibility to get to know people is a major advantage of learning activities. This applies to the same extent across all ages and levels of educational attainment.

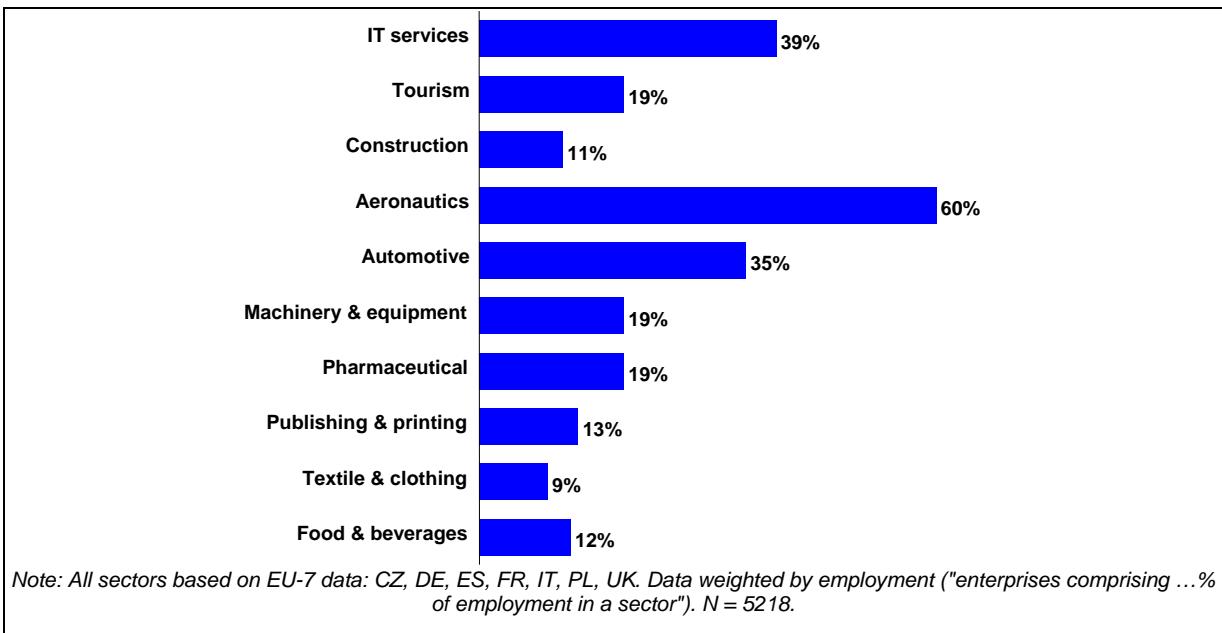
Figure 6: User orientation of eLearning courses, as perceived by users



Source: eUSER (2005)

4.3 ICTs in Career- and Job-related Life-Long Learning

ICT has sped up the idea of professional learning: Career-based learning so far has become a certification industry; courses, tests and externally acquired competencies are the main ingredients to allow workers to improve their position and not in the last place: to switch to another job. It may be clear that, seen from the perspective of the modernized ‘networked’ society (Craven & Wellman, 1973; Wellman, 1988 and Hiltz & Turoff, 1978) we have high expectations from the further evolution of learning based upon ICT-saturated infrastructures as we have in the western world (CEC, 2001).

Figure 7: Companies using online eLearning, in percentage of all companies in the same sector

Data source: eBusiness W@tch 2005.

The most global trend that can be derived from Figure 7 is that the web-based contribution to learning gets higher if the sector is of a more recent nature and thus needs a higher innovative speed, while the more traditional sectors like textile and food tend to benefit less. An additional explicatory fact is that in those more traditional sectors the penetration of desktop workers is smaller.

4.4 Networking and Social Capital

The essential contribution to learning practices nowadays is that, in contrast to the decades before, learners now benefit from a low-threshold access to information sources. Exactly because the need for access to abundant information is being fulfilled, it now becomes more clear that this access is not at all a sufficient condition for the sake of effective life-long learning. After the disillusion that ICT as an "information access commodity" falls short in instigating learning, we see the recognition among scholars that ICT's networking potential needs to be utilised for the creation of web-based communities (Wentling, Park & Peiper, 2006). As leading scholars have emphasised, society nowadays needs to make best use of the knowledge dynamics enabled via 'instant' peer consult. Salomon's paradigm (Salomon 1993, 1997) of distributed cognition pleads for a new learning culture that stimulates students to build upon each other understanding rather than promote an exclusive, individualistic and competitive learning climate. It also pleads for assessment methods where students may use the full functionality of the web, inclusively the consult of experts around the world. What does available evidence say about the extent to which web-supported learning networks are going to enable more widespread, more versatile and more effective life-long learning? Web-based learning communities act as networked "self-help groups" in order to understand new phenomena much quicker. Their speed and versatility widely exceed curricular-based learning. Augar et al. (2004, 2005) have found typical added values of web-based (often mentioned "Virtual") communities. Its typical effects can be described as facilitating collaborative icebreaker effects and the creation of knowledge repositories. The effect of community evolvement is often seen as a positive effect in itself, entailing to build a sustainable professional network for one's career phase.

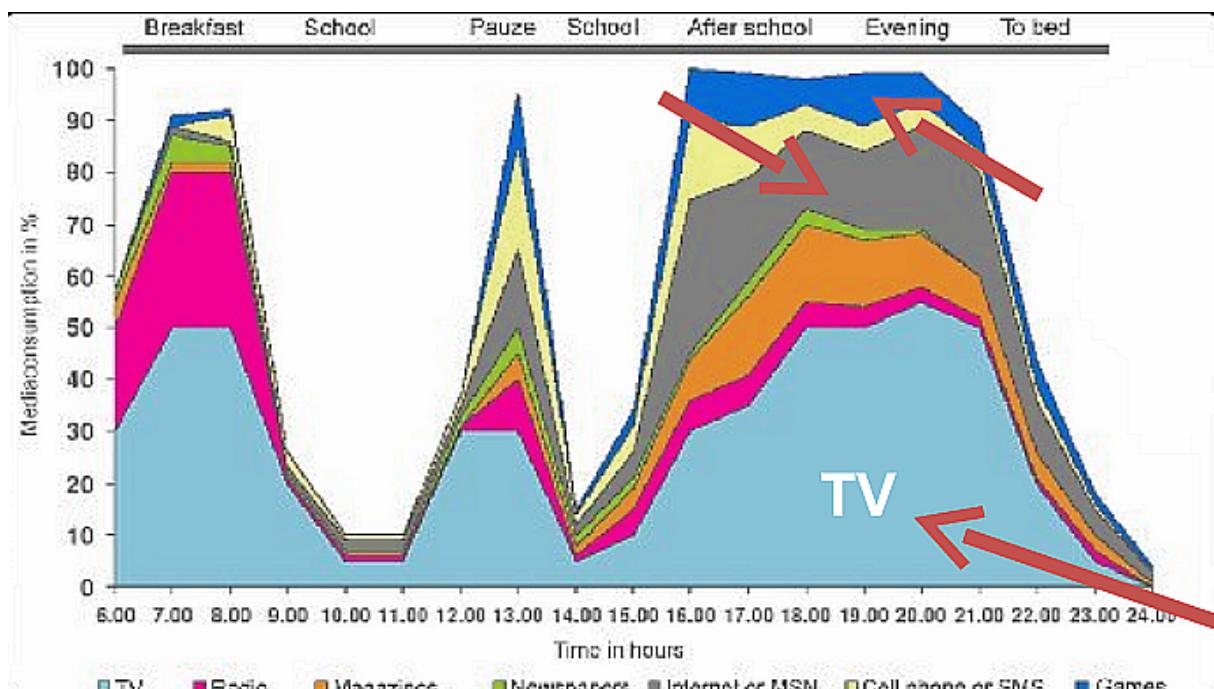
4.5 Empowerment and Participation

As we have argued in the introduction of the present report already, many scholars argue that the full potential of ICT to contribute to the essence of learning in the knowledge-based society has not been fully exploited yet. In order to explore this question, we need to analyse the extent to which ICT is being implemented as catalyst for transforming traditional learning into the new ones that fit in the needs of the network society (Krumsvik, 2009). To what extent has learning become more effective by letting learners become involved in the process of knowledge (re)creation?

4.5.1 Empowering the Learner

Empowerment of learners implies the transformation of learning styles from passive knowledge reception to a more active role in seeking out knowledge and evaluating its usefulness in real-world social contexts (Tuomi, 2006; Henderlong, 2002 and Persaud, 2004). This means that learning needs to become less dependent on regular educational regimes and more compatible with life-long learning attitudes. The considerable potential of ICT to enable this transformation is clearly evident. There is some evidence that institutional education systems, rather than embracing the potential of new ICTs which are widely popular among students, try to banish their use in education in order to preserve traditional teaching methods. One example for this is the use of **mobile devices** in education. While its real generic effect could well lead to just-in-time connectivity among learners in group tasks; this would arguably imply a major shift from teacher- to learner-oriented classroom education. In order to avoid this threat, many schools across Europe prevent students to use the mobile phone during school time anyway. An illustrative pattern is shown in Figure 8 below by Janssen (2007) shows the two major periods in a learners' secondary school day.

Figure 8: Absence of ICT Media during School Time



Source: Janssen (2007), <http://www.frankwatching.com/archive/2007/11/23/de-wereld-die-gaming-heet/>

The broadcast media like TV, radio, journals and the newspaper have a deep decline in the periods 9:00-12:00 and 14:00-15:30. But even more remarkable is the absence of using the Internet, mobile devices and gaming devices. The common expression in education is that the "real" learning cannot go together with the digressive effects of media; Bernard et. al.,

2009). Complementary is the enormous media access before, between and after school time; up to 90% of their available time altogether. A significant illustration of the limiting ICT impact in the schools is the large number of schools that prohibit learners to use their PDA or mobile phones even if it is for searching information.

Another example for a mismatch between education practices and the requirements of the knowledge-based society is the way **student performance is being assessed**. One could argue that if education pretends to prepare students for life-long learning we need to question if we should pursue the individualistic way of conveying and assessing learners like we have done for ages. If we take into account that at the same time the *collaborative enquiry attitude* is one of the most essential predictors for successful life-long learning, (Bray, 2002) than we realize that we have touched a rather massive conflict between school-based and real-world learning.

At the micro Level we see ICT tools like simulation and gaming become subordinate to the *instructional* metaphor: optimizing the learning through optimizing external conditions. As soon as it comes to 'learn to learn' current educational innovations are typically incapable to accommodate pedagogical processes like self-regulation and moral development other than "prepare yourself for the test". Teachers who fulminate against "new learning" soon fall back to "teach the test". Optimist may say that classroom practice has changed indeed. The teacher is inclined to pose intriguing problems rather than lessons to be memorized to the students. Fine, that sounds great. The real obstacle is in the nature of assessing learners' "outcomes". First of all final examinations target grading students individually; group efforts and students' talents to help others to learn are ignored. Moreover, during school-based examinations the altruistic nature of students to help others' learning may backfire as their team mates are suddenly they competitors. In other words: The jewelry of improving learning practices is destroyed by assessment practices from earlier times. At the same time we see that these students' employers look for team players rather than for soloists. Analysis of current practices in distance-, virtual-, ubiquitous- and flexible learning shows a strong reliance on well-established "course delivery" formula, while there is little experimentation with innovative learning styles (Lovelace, 2005). A striking example is the various national implementations of the British "Open University". Though its admittance procedure has become opened, the overall contract is that predefined course content needs to be transmitted and digested; the contribution of the learners to the actual understanding of the topic itself is not targeted. The Open University as potential exponent in benefitting from ICT shows that its institutional trend toward consolidation dominates the potential to innovate learning as such. The paradox is that institutions that aim at the learning of others have a remarkable low tendency to learn themselves (Wang, 2003). In 2008 the Horizon Advisory Board¹⁰ highlighted the growing interest for *creative expression* in education and learning. A good example of it is a tool like Google's Mashup Editor¹¹ that makes it relatively easy to create applications, grab online data, organize it, and display it the way the author wants. ICT has enabled education to transform faster. And not surprisingly negative effects became visible more quickly than positive ones. While, as many scholars argue, the established educational institutions tend to ignore the potential of ICT, learners of all ages, but particularly the so-called digital natives, have started to explore the Web-based learning communities to access knowledge about what they perceive as being of interest. Many students possess know-how about ICT-based learning opportunities which far exceeds the skills of their teachers. Optimally, they can train the teachers how to make best use of the Web in the context of education. A significant notion here is "regaining ownership of one's learning". There is no natural match between the institutional ICT ambitions and those undertaken by youngsters as they build their social networks. An explicit facilitation is needed

¹⁰ The Horizon Project, as the centerpiece of NMC's Emerging Technologies Initiative, charts the landscape of emerging technologies for teaching, learning and creative inquiry and produces the NMC's series of Horizon Reports. <http://www.nmc.org/horizon>

¹¹ www.google.com/gme/

in order to gain more synergy at this vital point. The cybernetic role of ICT has been quite a welcome metaphor for learning as process that relies on *external*- rather than on *internal* control. Rather than empowering the learner as an autonomous learner it have been ICT advocates who recognized the merits of channelling learning into one of “process control”.

4.5.2 Increasing participation in life-long learning: Overcoming traditional barriers

Following the work of Cross (1981) it has become usual to distinguish between barriers that operate at the structural/contextual level, those at the institutional level, and individual/dispositional barriers to participation in lifelong learning.

Structural/contextual barriers refer to the overall societal context which determines decisions to engage in learning and to offer training. “The nature of people’s lives, living conditions, communities, and sense of security shape not only whether they will enrol in education or become involved in other forms of learning; they help to form what people regard as relevant to their lives and what they might expect from active learning” (OECD, 1996, p. 92). ICT is unlikely to exert a *direct* impact in this regard, although the increasing awareness of living in a knowledge-based society – itself heavily related to advances in ICT – is bound to lead to changing perceptions of the need for continuous activities for knowledge acquisition in the longer term.

Institutional barriers refer to the supply of training and learning opportunities by providers, be it public or private educational institutes, or companies. At a very general level, a major institutional barrier to the promotion of lifelong learning is the fact that non-formal and informal learning are typically undervalued by policy-making as well as on the labour market (see the discussion elsewhere in the present report). The most important institutional barrier is certainly lack of **access to training**. Access to vocational and formal on-the-job training is usually provided by employers, which means that companies’ decisions on whether, how much and what kinds of training to offer to their staff are crucial here. Access to the tools required for self-learning is relevant for learning activities outside of training courses and the like.

Individual/dispositional barriers refer to demand for learning and education by end-users. Decisions of individuals are usually not based on the type of cost-benefit analyses which companies (presumably) base their decisions on, but to a larger extent on general dispositions, values and attitudes. Still, considerations of utility and costs do play an important role. Perceived lack of time is likely to be a more significant barrier than the actual costs of taking part in continuous training or self-learning measures. A Eurobarometer study conducted in 2003 (CEDFOP, 2003) found that among a given list of potential reasons for non-participation, the most often cited were family commitments, job commitments and having to give up free time or leisure activities (Van Rijsselt, 1994). The 2005 **eUSER survey** produced tentative evidence that online learning is indeed enabling more citizens to take part in lifelong learning (eUSER, 2005). This is a result of the flexibility eLearning offers for adapting learning supply modes to the individual demands of the user. *About one in four individuals who engage in an eLearning course would have been unlikely to engage in lifelong learning if it had not been possible for them to do this online.* This means that once (and if) online learning diffuses more widely among the EU population, eLearning is likely to contribute significantly to further growth of lifelong learning practice.

4.5.3 eExclusion

With regard to the impact of ICTs on education and learning, early expectations focused on the possibility to overcome traditional barriers to engagement in learning activities. Such barriers include lack of access to education services resulting from constraints of remoteness, cost or time. Because of the fact that differences in patterns of participation in formal as well as adult education are among the main underlying reasons for social inequality, any ICT-caused lowering of the barriers to access to education and learning services was expected to

result in improvements in social inclusion. However, a large part of the older population did not get to use ICT for learning at schools or work places. They run a danger of exclusion, not only in the form of e-exclusion in regard of today's media world, but also – as a result of this – from social life in general. With today's fast turnover of communication and cooperation infrastructures, lifelong learning has become a necessity just for mastering the basic tools of skills acquisition and social learning. To fully participate in a society which is increasingly dominated by knowledge- and information-rich environments and technologically mediated communication, direct ICT-related skills are required, as are advanced digital literacy skills such as information and strategic skills (Cheetham, 1998).

4.6 Learning for life-long learning

4.6.1 Towards a new culture of life-long learning

A fundamental question is whether real-world implementations of ICT in the education and learning domain promote, inhibit or have a neutral effect on the further evolution of learning practices. As exemplar we may observe how travellers may learn from GPS technologies rather than memorizing maps and switching the lanes on the high ways. Indeed it is the case that after having learned how to use the GPS device the traveller can expand his/her manifested skills at a local scale to a world-wide one. Learning to use ICT tools is a generic one that bypasses citizens to learn by heart the huge factual instantiations. At the same time it is the same technological commodities that encourage institutional learning to ignore the real impact of ICT. For example we see how educational publishers nowadays integrate GPS methods in school books now very quickly as instrumental skill for learning the traditional geographical goals even more stringent; rather than admitting that topography is now a matter of opening Google Earth they claim that topographical knowledge is now even more important than before as learner might get dependent from it in real life. The potential of ICTs for transforming the acquisition of knowledge and skills is, therefore, by no means limited to intentional and structured processes of education and training.

4.6.2 Skill requirements

ICT has been the quickest developing technological strand in the last two decades. The field of learning and education was and still is the main sector for making citizens "aware", "literate" and "skilled" in this field. In so far as directly ICT-related skills are concerned, a distinction is being made between e-skills and digital literacy skills. E-skills themselves can be broken down into:

- **ICT practitioner skills:** The capabilities required for researching, developing and designing, managing, the producing, consulting, marketing and selling, the integrating, installing and administrating, the maintaining, supporting and service of ICT systems;
- **e-Business skills:** the capabilities needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organizations, to explore possibilities for new ways of conducting business and organizational processes, and to establish new businesses.
- **ICT user skills:** the capabilities required for effective application of ICT systems and devices by the individual. ICT users apply systems as tools in support of their own work (which is, in most cases, not ICT) or private life.

Both ICT practitioner and eBusiness skills are accredited competences required for performing expert work surrounding the design, implementation and maintenance of ICT systems. ICT user skills are required by a much larger (and still increasing) share of the workforce. ICT user skills tend not to be accredited, with some exceptions, such as in the case of the European Computer Driving License (ECDL), which is in widespread use in some EU countries. In addition to these directly ICT-related skills, there are skills of a more generic nature which are required to fully participate in a society which is increasingly dominated by

knowledge- and information-rich environments and technologically mediated communication. These are often subsumed under the term “digital literacy skills”. For the conceptualization of the different kind of skills which make up digital competence, the categorization suggested by Steyaert and further developed by van Dijk (Van Dijk, 2005) is of particular value. They differentiate between operational (instrumental) skills, informational (structural) skills and strategic skills:

- **Operational skills** are needed to operate ICTs (computers, software, Internet connections, mobile devices);
- **Information skills** are required to search, select and process information from computer and network files, which implies the ability to structure information according to specific requirements and preferences;
- **Strategic skills** denote the ability to take own initiative in searching, selecting, integrating, valuing, and applying information from various sources as a strategic means to improve one’s position in society. It often implies the continuous scanning of the environment for information which might be relevant to the four spheres of life: personal life, family life, work life, and community life.

Further basic skills needed for lifelong learning are skills of critical thinking, e.g. in the context of evaluating results of information searches. A related critical attitude towards any kind of information offers and media has to be learned. Recent performance tests of these skills among the Dutch population have shown that operational skills are possessed to a reasonable degree but that performances of information and strategic skills on the Internet are far below expectations¹². This also goes for the youngest generation (Van Deursen & Van Dijk, 2007). More generally; any definition of digital literacy must be open to new technological and market developments which will become relevant in the future. Against this background, it may make sense to define as the focus of digital literacy any ICT-enabled means with which to access, manage, integrate, or evaluate information, construct new knowledge, or communicate with others.

That, at the other hand, there is only a little use of more advanced learning forms such as computer-supported cooperative learning has to do with a bureaucratization of formal education, which still focuses very much on an ever-growing canon of knowledge and rarely upon making the students learn how to increase study skills. In contrast to the rigid organizations of formal education, students seem to be much more open to learn by doing. For instance, students who enter higher education already are members of web-based social networks. They have their own tool repertoire; develop/obey correspondence conventions and etiquette. Mobile devices, flexible software tools like voice recognition are fully integrated in their daily life. In other words: Regular education concentrates on its short period learning effects, while students are much more keen on acquiring life long learning skills with ICT.

Incidental learning (supported by access to the Internet) has a major influence on the amount of skills a person is likely to acquire (Elley, 2005). Incoming students do not necessarily master the needed ICT skills. Yes, there is an “ocean” of user-created content, collaborative work, and instant access to information of varying quality. However students lack the skills of critical thinking, research, and evaluation (Hamby, 2007). Indeed the more fundamental underlying question is if this attitudinal aspect at the students can be ascribed to preceding educational stages. At the same time, however, the large majority of students who enter higher education already are members of web-based social networks, and have a deep knowledge of related tools, conventions and etiquette. Mobile devices and flexible software tools are fully integrated in their daily life.

¹² Euractive Report (January 29, 2009)

4.7 Discussion

4.7.1 The micro level: Learn to Learn

At the micro Level we see ICT tools like simulation and gaming become subordinate to the *instructional* metaphor: optimizing the learning through optimizing external conditions. As soon as it comes to ‘learn to learn’ current educational innovations are typically incapable to accommodate pedagogical processes like self-regulation and moral development other than “prepare yourself for the test”. Teachers who fulminate against “new learning” soon fall back to “teach the test”. Optimist may say that classroom practice has changed indeed. The teacher is inclined to pose intriguing problems rather than lessons to be memorized to the students. Fine, that sounds great. The real obstacle is in the nature of assessing learners’ “outcomes”. First of all final examinations target grading students individually; group efforts and students’ talents to help others to learn are ignored. Even:

During school-based examinations the altruistic nature of students to help others' learning may backfire as their team mates are suddenly they competitors.

In other words: The jewellery of improving learning practices is destroyed by assessment practices from earlier times. At the same time we see that these students’ employers look for team players rather than for soloists. So the message is: Schools, give up your traditional criteria; admit the change on societal needs.

4.7.2 The meso level: Learning by Transfer

At the meso level we see attempts to transform the “learning by transfer” into the “learning by development”. School leaders and institutional creeds advocate their students to become autonomous and authentic learners who have the attitude to excavate and even ‘create’ new understanding. Similar phenomenon at the meso level is the introduction of “competences” rather than knowledge and skills. Its implementation under the same basic contract however falls back upon a checklist for observing the learners to prove mastering “competences”. At the macro Level we observe policy makers embracing ICT as a way to monitor quantitative educational outcomes more and more. Incentives to get good national ranking stimulates institutes, teachers and students to comply with national tests primarily. Also this mechanism shows that ICT is instrumental to make students and teachers keen on ‘standards’ rather than diversity and authenticity.

The optimistic view is that teachers and students will not give up their authentic learning modes in favour of the test criteria to be expected finally.

This might be case for some. However it is good to be aware that since the 1970ies the dominant cybernetic question has been formulated: What is the goal of your learning and lesson plan? This so-called “didactic analysis” has not been supplanted by an explicit alternative didactic design paradigm since then.

4.7.3 The macro level: Learning as Management

Institutional policies advocate the integration of “learning management systems” rather than learning support systems in education. Its effects penetrate the meso level. As it comes to the actual level of didactics and teacher guidance there are only sporadic effects of ICT in the learning methods. Its explanation is that the final account for successful teaching and learning is in the students’ score on centralized examinations. These ignore the more authentic learning achievements by learners. In other words: The incentives for teachers to apply ICT innovative learning methods are not there yet. In terms of policy recommendation this should be high on the agenda for the coming decade at least. Optimists will bring forward that the summative effect of ICT tools and infrastructures in learning are positive and we should embrace further technologies subsequently. This position may hold for policy makers

at large. However if we attempt to understand, tune and predict one level further it is not enough to welcome this summative conclusion.

Summarizing

- Micro: the incentives for integrating the ICT commodities in education do not spontaneously work out well. At the micro level (learning and classroom instruction) there are no revenues for teachers and learners who invest in the learning of their colleagues and co-students. This means that school-based learning is not congruent with the flying wheel effect between co-learning professionals and citizens who benefit on a win-win basis by the fact that best practices are shared. This win-win should be part of the school assessments as well.
- Meso: the learning habits as it evolves in peer groups among teachers and students will slowly penetrate through the more institutional trends as its managers finally need to harvest from this “new dynamics”.
- Macro: ICT has lost its position from the strategic agenda as it became less and less a Unique Selling Point. The real integration of ICT has thus shifted from a corporate concern into the level of tactics (Meso and Micro Level). As long as educational institutions have not yet discovered the strategic value of web-based learning communities it is not likely that they recognize its strategic value.

5 Conclusions and policy implications

5.1 Synthesis

In order to assess the social impact of ICT in the domain of education and life-long learning, our approach was to start from an understanding that ICT is instrumental to learning, and learning activities are instrumental to societal ambitions at a given moment in a given social context. From the analysis of ICT in regular education we may conclude that the instructional, curricular and assessment-driven scenario are to be overcome in order to make the learning process more flexible, alert and vital. Our analysis has attempted to discern the *catalyst*-versus the *reorientation* effects of ICT in education.

One of the key notions is the *basic contract*: learners need to incorporate what has already been mastered by the elder generation. Its typical consequence is that regardless of ICT sophistication and its “seamless integration” we see that “the new learning paradigms” have only little or even detrimental effects in ongoing educational innovation programs. ICT by its nature already stimulates life-long learning and can offer even more support in the next coming years. Seen the momentum of formal (institutional) education it is inevitable to look as a curator to this wide societal and economical sector. The first symptom is that already students start building their web-based social networks. It will be hard for institutional players to build on them while keeping both the students’ enthusiasm and the institution’s need for robustness in tact. Life-long Learning is a much more versatile practice; it is often a momentary “just-time-learning”. ‘Communities of Practice’ are pragmatic solutions for building upon the colleagues’ expertise and subsequently for retrieving one’s own experiences so that peers may benefit from it. Besides the well-known factors like declining student enrolments and growing costs reports like included in Appendix 1 mention two problems explicitly:

- Incoming students do not necessarily master the needed ICT skills. Yes, there is an “ocean” of user-created content, collaborative work, and instant access to information of varying quality. However students lack the skills of critical thinking, research, and evaluation. Indeed the more fundamental underlying question is if this attitudinal aspect at the students can be ascribed to preceding educational stages.

- Students who enter higher education already are members of web-based social networks, its tools and its conventions and etiquette. Mobile devices, flexible software tools like voice recognition are fully integrated in their daily life.

The question is how can higher education with its centrally-orchestrated ICT infrastructure accommodate this large variety? One option is to allow higher educational institutes to build a thin layer of web-based facilities and leave it to incoming students to rely on their own connectivity. At this point we may expect higher education to explore all kinds of creative solutions and will gradually start advertising them as a unique selling point.

In conclusion: ICT has been adopted as a welcome tool for sustaining instructional procedures in the second half of the twentieth century. At the same time the learner nowadays recognizes the impact of the web and in fact enjoys the lack of instruction as the web and interactive programs allow the user an optimal freedom to navigate and branch all the time. It seems that the perceived ICT roles have been understood quite different by those who learn versus by those who teach. We may summarize that learning technologies have opened many possibilities to make life-long learning more "active" and "student-driven".

If your goal is to make others learn, it looks like interfering to accept that you as teacher are in the midst of learning yourself as well. ICT as enabling infrastructure cannot mitigate this perceived infringement of the overall contract, except that it makes learning institutions even more keen on the potentially negative side effects of ICT; negative in the sense of 'conflicting with the fixed curricular goals'. A good example is the large number of schools that prohibit learners to use their mobile phones even if it is for searching for information. If we take into account that at the same time this enquiry attitude is one of the most essential predictors for successful professional learning than we realize that we have touched a rather sensitive declination between school-based and life-long learning.

Apart from sporadic initiatives there are no signs of education to incorporate the real potential of ICT. The main stimulus to take ICT seriously is the urgent need for active, creative and collaborative learners. If schools keep ignoring this challenge there is a chance that young learners consider schools as "social duty"; they will explore the web-based learning communities to access the "more important" notions for life. An emerging awareness is that learners learn despite of the curricular regime; they already learnt how to cope with ICT opportunities and hurdles. They teach the teacher how to benefit from the web, and thus learn in a reciprocal way. A significant term here is "regaining ownership of one's learning".

Authority is taken as a derivative rather than *an a priori*. This process slows down as long as employers tend to rely on the status of certification rather than assessing employees' acquired capacities like problem solver, team player, solidarity etc. themselves. In terms of "Finite and Infinite Games" (Carse, 1986), learning tends to transform itself all the time. However institutions prefer to consolidate the basic contract in order to reduce uncertainty. While promoting "quality awareness" throughout all levels of education, we see those information systems and its underlying "rational" jumped too easily on aggregating quantitative learning outcomes. Rather than asking "what qualities of learning" should be taken into account, it became attractive to reify what could be measured. The fact that date became available for managers and decision makers has helped to see learning as a transfer- rather than as a developmental process.

It is seen as an undisputed fact that mass media had an enormous impact on the emancipation and self efficacy of citizens in the 1960s and 1970s (Garnham, 2002). It is now the question if ICT is instigating a new trend in education with a similar direction as the mass media before. The introduction of ICT in western society has affected the role and practices of learning dramatically. The fact that information access and consulting human expertise has become a commodity rather than a privilege of professionals and experts is its most obvious phenomenon. The traditional approach is to see education as a process that transfers knowledge and experience from the elder to the younger generation. ICT in combination with emerging needs of knowledge economies has promoted learning that

exceeds this transfer process; it relies on education that innovates existing disciplines and in fact develops new understanding.

The perceived antagonism between working, playing and learning can only be resolved when all three domains become recognized as various components of the same; both the person and the group need learning in order to cope with societal changes. Strange enough ‘learning’ has conquered its relevance too far; it has become a tool for overcoming social stratification and has thus become a goal in itself. Discussing “the right to learn” and “the duty to learn” has obscured the essence of learning. The genuine life-long learning can best be seen as the ideal way to both avoid “surviving by adapting” and “surviving by escaping”. Learning is the optimal combination of accommodation and assimilation; Its goal is to preserve the person’s identity by incorporating the essence of his/her surrounding.

In the last thirty years we saw that ICT failed to innovate formal education. We expect life-long learning to benefit more from coming ICT learning support. ICT has not only worked out as a smooth catalyst ingredient. ICT has inflicted the essence of learning; it has reformed learning from a transfer- into a process of development.

The evolution and intrusion of ICT for life-long learning has been built upon three main trends:

- Trend 1: ICT tools and methods for learning have initially been developed for the sake of supporting individual learning processes. Ideals like adaptiveness, differentiation and individualization have been the main values for undertaking the many projects in “Intelligent Tutoring”; all attempts to exceed plenary and collaborative teaching practice. The main effect of these ambitious projects has been the recognition that it is hard to emulate person-to-person communication and its senses for mutual understanding.
- Trend 2: Quite different are the institutional ambitions to involve ICT systems for mainstreaming the diversity of students. Its underlying attempt is to make learners fit in a workflow regime. Though its adagio is “study where- and whenever”; you have always access to your resources and even to your study mates. In practice these so-called web-based learning support systems have led to an ever more prescribed study mode and study speed; as all details are on the web, there is no excuse for the student to stay behind other than having ignored the study guide; (“repressive tolerance”). This is exactly what institutes need in order to reduce risk and student indolence.
- Trend 3 is the learner who continually develops a personal learning style via networks as they develop on the web. This process is the most prospective candidate for ICT-supported life-long learning. In contrast to institutionalized (formal- and certificate-driven) studying this learning process has a just-in-time nature, and allows a much greater deal of intrinsic motivation as its goal is to find immediate answers for a current situation.

The choice of this project to highlight ICT for “Life-Long Learning” already shows its implicit expectation that neither the first- nor the second trend is an acceptable candidate to be extrapolated in this study. The third trend is indeed the most likely one that will transcend from all current practical constraints. The intriguing question then is if and how regular education will accommodate or even incorporate this growing momentum of the “emancipated” learner. As illustrated in this report it is the “Overall Contract” that allows regular education to continue Trend 2. Its ideal is to optimize the learner-throughput and to refrain from diversity in terms of students’ individual characteristics. For this reason it is quite likely that a dual situation will survive for quite a number of years. At one side it is Trend 2 where institutes attempt to streamline the variety of students with the help of Web-based conveyance systems. At the other side students will continue to articulate highly personal traits in learning style, personality and a large variety in prior knowledge. As Web-based learner communities develop it will become more and more problematic for institutes to ignore these two tracks. Some of them will promote the situation of blended learning: Help students to achieve the prefixed curricular goals via a wide landscape of alternative roads

and via acknowledging students' individual portfolio master pieces plus granting shortcuts based upon so-called "Externally-Acquired Competences".

- Trend 4: A special case is the learner who is not keen on being certified. This may be the largest group of learners. (S)he learns in order to perform better (professional increment) and benefits from the web as open access source of expertise.

As in the preceding half century the underlying paradigm of learning focused on instruction (the systematic- and the guided transfer of information from the expert to the novice), there has been an excessively high ambition on the role of ICT in enabling learning as a *dissemination* rather than a *developmental* process. In its more rigorous shape, learning may cause sectors to diminish like the travel agent, or the job secretary. The typical mechanism here is that ICT suggests workers to incorporate earlier specialized skills in other professions.

In terms of a next research agenda we need to understand in a more detailed way why the major benefits of ICT are overlooked and ignored in learning practices. Is it the institutional inertia? Is it our fixation to traditional assessment methods? Or is it simply because we lack the didactic repertoire on how to accommodate the more active learner attitude? At the same time the ubiquity of information and online human support triggers the question if the traditional epitome of "life-long learning" can still be considered as "learning" as we tend to conceive in the context of formal- and vocational education. A complicating factor in answering this question is that regular education itself is tempted to revise its main paradigm, so that it is hard to find solid reference beacons for deciding who is changing most: School-based education or life-long learning for adults. Regular education attempts to evolve from a transfer- into a developmental paradigm. Life-long learning tends to migrate from "incidental- " and "continuous learning" into "course-based-", "institutionalized-" and "certificate-driven" learning. Its mutual comparison is like estimating the speed of two opposing trains without seeing the landscape. As overall characterization we may say that ICT has enabled learning to emerge constantly, everywhere and on demand; Instead of being limited by connectivity (in its social or technological sense) or by accreditation (limitation in terms of prerequisite certification) it is now primarily the person's "interest", "curiosity" and "perceived need to learn" that counts. ICT has made learning resources into a commodity; and more: Learning attitudes have become endemic to survive in modernized society. The question thus became if and what explicit orchestrations we still need, now that learning cannot be discerned as a goal in itself?

5.2 Policy Implications

Additional efforts are needed to raise awareness among policy-makers that the potential added value of ICT has so far been exploited to a very small extent for fostering effective life-long learning. There are possibilities opened up by ICT which Europe needs to utilise much better than it does today. Which are these? How can they be exploited better the coming years? What potential benefits remain to be explored further? And how can policy effectively foster a broader use of ICT for meeting its goals with regard to lifelong learning?

A good approach would be to instigate teachers to build and invest in social media networks in order to support their day-to-day teaching. Important for the transformation of education is the use of learning communities for teachers; once a teacher feels robust (s)he can announce his/her role as mentor/mentee in order to find colleagues to spar with and find practical solutions. This would make them understand much better the ways students learn from social networking. ICT has brought "social software" (the Web 2.0) and "web-based communities". Seen the imperfect distribution of ICT skills it seems a good idea to orient teachers further on how to use the tools and methods that underlie social software. This is the way to let life-long learning penetrate real life. In respect to national- and EU-wise investments a number of new incentives may be needed. Now as urban societies can be considered as saturated by ICT, it is inevitable to reconsider this long-term belief:

- ICT as information and communication facilities should no longer be seen as endemic to innovative learning. More urgent is the notion that learning is a social and an emancipator societal process that should not be delegated exclusively to institutions. The recommendation is to open the educational floor to more diverse players. Not by promoting further privatization of school-based learning, but by giving parts of the national educational budgets to any person who offers face-to-face tutoring to youngsters. The fee providing learning support is a voucher that gives the right for being taught yourself. The formula for the voucher tutor-tutee transaction equals: Qualification x time x learning-effect. A trusted body should administer learning transactions and balance the voucher- against Euro equivalents.
- Teachers, both at the secondary and tertiary level, need to compete with the effects of “ambulant” tutors as described under the first recommendation. Vital precondition for allowing a more developmental learning in schools is that learning effects are no longer assessed by centralized uniform examinations. Instead of that learning should be evaluated on the basis of individual learner reports (portfolio dossiers) with authenticity, creativeness and societal/technological value as main criteria. Teachers should adapt their practices to the more unique learner profiles of their students.
- ICT is a vital (but not a sufficient) precondition for this evolution of the teacher role. Rather than bringing ICT to regular education it is now urgent to instigate new learning paradigms in the networked ICT society. Social constructivism is a promising paradigm for describing societal awareness and learning at the level of a community.

The European Commission should be encouraged to invest in several ways:

- **Let its member states support** networks of experts, brokers and moderators who take an explicit altruistic stand towards life-long learning
- Facilitate a bank for **Learning Vouchers**. The Web 2.0 provides ample facilities to let learning-minded citizens to find each other and recruit experts rather than teachers. The voucher mechanism should be formalized as a tokenized currency expressing someone's credits for allowing others to learn rather than “learn” in a solistic way. An inventory of potentially dynamic market players should be scouted in order to fill the gap between generic social software and the more specific tools for collaborative learning.
- **Integrated strategies for sustainable life-long learning**. Once they are formulated they become more and more important on the policy agenda. It will become clearer that life-long learning embodies a cultural aspect. It contributes to the main guiding principles of sustainability: solidarity within and between generations; an open and democratic society; the involvement of citizens; the involvement of businesses and social partners; policy coherence and governance; policy integration; the use of the best available knowledge; precaution as the main principle; and the internalization of environmental costs. This implies that indeed there will be a good chance that “ICT for learning” will become the second biggest catalyst for emancipating education after the one of social movements that fought for equal access to schools during the 20th century.
- Studying the dynamics of **learning in communities of practice** is still at a premature stage; we are still far away from understanding how the conditions for eliciting learning rather than just cooperation should look like.
- Outside of formal education, people share knowledge in networks or Communities of Practice, which are becoming of utmost importance for acquiring expertise in ever-changing environments. Related informal learning does not necessarily mean de-institutionalized learning. **There have to be new formats of bringing formal and informal learning together. This demands new forms of organization, certification and remuneration of learning and teaching or coaching.**

- Skill development: It is important to take into account that digital literacy is by no means limited to the utilization of the Internet. Any definition of **digital literacy needs to include the full spectrum of (current and future) ICTs, which include mobile applications and services** which are expected to become much more dominant in the coming years.

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[C] Work

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0 Executive Summary

ICT and the work domain: hopes and fears

In the work domain technological change has been dramatic during the last two decades. As the implementation of ICT has generally been accompanied by a restructuration of organizational processes, the division of labour has been affected by ICTs (= applications of ICT) for inter-individual, inter-group or inter-organizational (tele-) cooperation, industrial clusters, company networks, virtual teams, remote management and off-shoring. But today's work domain is also affected by the supply and demand of work, the cultural value of work, unemployment and social circumstances, for example, the opportunity for part-time work and work-life balance.

The quality of work has been defined by the Eurofound as ensuring career and employment security, maintaining the health and well-being of workers, developing skills and competencies, and reconciling work-life balance. The issue has been discussed within the European Union as an important political aim, and the diffusion and use of ICT in the work domain and its impacts on the quality of work, alike. First evidences regarding the impact of ICT on the working conditions in Europe, and related demands placed on workers (such as qualification and skill level) have been elaborated and will be presented in the following. However, technological change turned out to have been complex, and its effects upon work ambivalent.

It is necessary to reconstruct the expectations which accompanied the genesis of ICT and contrast them with factual developments, if one wants to understand the process better and learn from experience. There were utopian visions such as the "Paperless Office" and "Computer-integrated-Manufacturing" which saw a positive role of technology, while dystopian visions negative ones (such as "capitalism without work"). With new visions emerging today, the early ones seem to be of no more value, but assessing the actual realization of the early expectations is a major source of experience. New visions may be necessary to mobilize today's projects, but cannot replace empirical scrutiny of former technical expectations, if today's decisions are to be based upon experience.

One part of the early expectations was the assumption of a de-industrialization as a consequence of the ever further penetration of production by ICT. Under the label of the "post-Industrial society" and "post-Fordism" developments in the work domain were contrasted with "Industrialism" and "Taylorism/Fordism". With the World-Wide Web evolving during the 1990's, the emerging discourse on the "Information Society" was partly influenced by the aforementioned discourses, but organisational structures seen as the centre: In order to be successful in the new societal conditions, organizations needed to adapt their structures to integrate both the generation and use of information. However, applications often differed from anticipations, even in case of technical success. It turned out that data, information, knowledge, and competence had often been too little differentiated, and practice too little empirically studied in the anticipated application domains. The belief into a purely "technological fix" once again proved to be wrong.

When rethinking the expectations about a post-industrial society, it is obvious that even in spite of ongoing tertiarization Europe still has industrial production and is more a modernized industrial society than a post-industrial one. Furthermore, unemployment has not been overcome in the recent time – but Europe is also far away from "capitalism without work". And while ICT implementation often contributed to job enrichment and work satisfaction, it also led to neo-Taylorist work forms, for instance, when looking at call centres. And while some of the expectations related to the implementation of ICT did not come true, some trends emerged which had not been expected as such. For instance, considerable economic

success was related to "prosumption", which, however, has yet only little affected industrial work. Where change happened, ICT generally was not the only factor for changes. In the work domain one thus finds very ambivalent experiences.

Learning from experience

When studying the role which ICT actually plays, it becomes obvious that "impacts of ICT" have to be differentiated. "The impact of ICT" is not solely dependent upon intrinsic properties of technology, but also upon the socio-cultural situation in which technology is developed, implemented and used. Related differentiations require an empirical view upon technological processes instead of dogmatic assumptions about technological or cultural determinism.

Therefore, one must not lose sight of the ICTs and the particularities of their implementation and appropriation at stake when discussing impacts of ICT. This is: one has to study them empirically. In this context, research shows that on the short term, ICT often contributes to output growth instead of productivity growth; only when "complementary organizational investment" (Brynjolfsson, 1993) allows for applied forms of technology appropriation, ICT makes work more productive. Therefore, the appropriability of cooperation infrastructures has become a prerequisite for self-organized restructuration.

In this context, it is striking that many successful examples in Europe are situated in Scandinavia, where engineering has a long tradition of responsibly dealing with socio-economical and socio-technical issues. In particular, the tradition of Participatory Design cared about the crucial role of end-users for technological development and tried to improve the quality of working life, at the same time. Instead of perceiving organizational issues as a mere result of technological changes (like the followers of technological determinism), a joint improvement of social and technical factors was looked for.

A major contribution of this type of research was the identification of the decisive role of articulation work (and work practices below the level of organizational roles in general) for technology appropriation – and thus for technological innovation and organizational agility. One strand, therefore, led to conceptions of combining ethnographical on-site research and technology development (workplace studies, *Business Ethnography*, ...), another one to end-user participation in systems development (e.g., End-User Development, EUD).

Related conceptions of design-in-use have a large potential in the work domain, as they attempt to use existing and emerging competences of the work force to develop and tailor its collaboration infrastructure: this cultivation of tailoring cultures in enterprises can lead to more appropriate technology in the organizations, and to more competences of self organization, at the same time. This type of research detected, among others, organizational roles supportive for technological innovation in organizations such as "ICT gardeners" or lead users and unveiled their creation, use and sharing of knowledge as organizationally highly beneficial, but informal. It was, however, elaborated that the informal nature of learning in organizations does not necessarily imply un-institutional (and un-certified) learning.

Established foci of technology assessment on ICT

The complexity involved makes it understandable (and partly rational) that a lot of studies on social impacts of ICTs focus upon easily identifiable phenomena. For instance, access to computers and the internet was used as indicators for technological change. Related studies unveiled the danger of e-exclusion for those who cannot access such technology. As another indicator of technological change, the spread of telework has been studied, as here ICT had enabled individuals to choose the place where they work more freely. This new concept of working was very prominent in the 1980s and 1990s in the discussion on flexible organizational structures. Telework may allow for a more comfortable transition out of work

life for ageing individuals through combinations of partial retirement and homework. On the other hand, research showed that telework may also cause stress upon residual non-work time. Telework has some potential to contribute to more flexibility, but will (at least for the nearer future) remain a more exceptional or additional form of work.

To understand how ICT has strongly affected work, one still primarily has to look upon the premises of the enterprises. In this traditional work sphere, there have been strong efforts for ICT-based integration of activities. A lot of communication and cooperation within and among enterprises today is based upon ICT. Therefore, the concept of "eWork", covering some third of EU work force, involved communication via e-mail, video-conferencing or electronic data transfer with colleagues working at other locations of the same company, customers, clients, suppliers and other business contacts. E-work was to comprise phenomena such as virtual organizations and eOutsourcing and to cover work in Non-Profit- and Non-Governmental Organizations, social-welfare- and service organizations, too.

Related research shows that (not unlike in traditional work) the variety of skills, the significance of tasks, the autonomy of and feedback on work is of major importance. While high-qualified staff in advanced positions tends to be able to benefit from eWork, low-skilled staff often experienced more direct control and formalization. Increased work intensity (strongly related to health problems) and even more repetitive work forms could result from ICT implementation for low-skilled workers. Repetitive strain injuries (RSI) are affected by intensive computer use, e.g. intense computer-mouse use may lead to health problems.

The white-collar bias

While most research focused upon white-collar workers, the work of lathe operators, ship navigators or cashiers, to name only a few, has also strongly been affected by ICT, even if they did not regard their tools to be a computer. When awareness for the necessity of active competence-sensitive research lacked, Taylorist automation prevailed as the design rational. Many ERP, PDM and other business ICT systems thus unnecessarily endangered self-organized and quality-oriented forms of work.

The introduction of ICT into the work domain was most visible among "white-collar" workers, who became equipped by their enterprises with PCs and Laptops. In contrast, a lot of ICT applications in the work domain are not visible and one comes to wrong conclusions about the impacts of ICT if one does not take them into account. The "invisibility of ICT" sometimes is the result of a design rational: e.g. in "ubiquitous" or "ambient computing". When related conceptions such as "roomware", "wearables" or "networks of things" sometimes sound like science fiction, this is partly as related products are invisible. In recent time, RFID technology represented a highly important further step in this direction and is influencing massively all sorts of logistics. EC has taken action to establish a related legal framework.

Some studies speak about intensified self-economization and a new type of employees emerging in a revolutionized work domain: the labour-entrepreneur, who is characterized by increased autonomy in terms of work/life-balance, qualification and responsibility. The emergence of new, more flexible occupational roles in Europe cannot be denied, but this neither implies that flat hierarchies and self-organization have become common, nor does it mean that large bureaucratic organizations, in which new work forms are confronted with strict limitations, are on retreat.

In "produsage" producers adopt the ideal of a user who becomes coproducer of his/her own usage environment. However, the underlying phenomenon of "prosumption" has sides. On the one hand, producing users are used by organizations to reduce costs (travelers printing their own tickets, bank clients generating their own account statements, etc.) - not all of such strategies are based on new ICTs (see: self-service in super markets and fast-food restaurants) and dangers for existing employment. On the other hand, prosumption allows for innovative products to be developed, and for supply and demand to be synergized better. It

has to be shown that there are strong counter-forces against an exploitation of flexible production forms such as prosumption as business opportunities, e.g. institutional inflexibility, guarantees and defect liability etc. Further related research is needed.

The diversity of effects given, it is partly understandable that a lot of research on the social impact of ICT has concentrated upon easily visible, complete "New" such as technologically enabled cooperation and communication forms. Research on telework and eWork gave first insights into opportunities and problems related to ICT in the work domain. However, this research focused too much upon spectacular new phenomena and on white-collar worker. It cared too little for fields, which were not seen as typical for computerization, even when they had strongly become affected by it. When addressing the overall impact of ICT upon the work domain, the whole picture is complex and ambivalent.

Towards a realistic understanding of the Information Society

ICT is often described as a potential, but also as a challenge for learning. However, this does not mean that the implementation of ICT is indeed accompanied by the necessary qualification measures. Evidence instead shows a lot of examples for technological-fix thinking in technological innovation within the work domain. Seen from the top, black spots of awareness are organizational implications of technology implementation and maintenance, seen bottom-up, existing competences and unexpected effects of technology appropriation often are too little considered. Beyond the organizational level, knowledge spill-overs mediated by ICT have been identified, for example, in regional inter-firm networks - but only in supportive environments. Related research shows the importance of trust, mutual understanding, shared values and commitment of the workforce (such as Communities or Networks of Practice) for economic success stories. Nevertheless, innovation still is often only organized as a matter of technology.

It is obvious that in the ICT branch, a lot of new jobs have been created. However, e.g. within automation projects, there are also examples of job losses as results of ICT implementation. Similarly, there are examples of net de-qualification of occupational roles and increased control as a result of computerization, although it is generally expected to function (and often functions) as a means of job enrichment. From a macro-economical perspective, the feasible and important social inclusion of vulnerable marginalized groups such as poor or elderly in the work domain demands for labour- and competence-intensive strategies on the way to the Information Society. On the micro-economical level, competences are needed to deal with challenges such as complex products. Furthermore, the ICTs to be implemented must be supportive for these competences, at least, usable.

In this context, some EU member states protect the participation of staff representatives in the decision-making of the enterprises with considerable success. Politics also support the sort of engineering that regards learning not only a duty of technology users, but one of technology designers, as well. According to socio-technical design, technology designers have to learn how their products support existing competences best instead of replacing them. Research shows that there is a big potential for organizations, if technological infrastructures can be tailored accordingly. The related infrastructural and organizational challenge explains the mentioned productivity findings of Brynjolfsson.

Differentiating between technology applications and their social impact-anticipations

When the notion of "social impacts of ICT" sometimes is confronted with critical remarks (even in this report itself) due to the danger of too little differentiation and premature generalizations, this is no counter-argument against technology research as such, on the contrary. However, if such research is not to "come too late", it already has to address ICTs at the moment, when it becomes clear (or could become clear) that initial anticipations fail. And this generally happens within the development process. As this implies a formative role

of technology assessment, the latter has to remain open for unexpected (and sometimes unpleasant) experiences. And when experience shows that the visions which motivate the development of new technology are often not identical with the practical outcomes, in particular, in innovative applications, there have to be opportunities for rational re-adjustments within technology projects or programs (re-adjusting strategies to the initially anticipated product is then only one possibility: the adjustment of the project anticipation to lessons learned in the projects might sometimes be a promising way, too).

Such learning demands technology projects, which are organized in an iterative and reflective manner. One has to stay away from any form of technological determinism and to be prepared to learn from empirical evidence. ICT has neither per se to be disastrous, nor are factual ICTs necessarily the technological fix for the problems they address. Instead one has to discuss the good (or bad) referring to the actual socio-technical situation and to study practice to find out how it is related to the different elements of ICT evolution mentioned above.

Main policy criteria in the work domain are (net) job creation and enrichment, (net) social inclusion, (net) product innovation, (net) sustainability and the (net) development of existing competences. A realistic assessment of pros and cons is needed for technological decision making. Although this seems to be self-evident, it is not at all a matter of course: still too often, decisions remain only based on anticipations instead of empirical scrutiny, or even on general prejudices about technology. Therefore, long-term technology politics should support efforts to stronger relate technology development to critical, empirically-based technology research, which may derive and develop an understanding of technology platforms, applications as well as appropriation and maintenance forms. Only on the basis of such empirically based understanding, realistic technology politics may gradually be improved.

Successful examples, for instance, in Scandinavia show that it is not necessarily the largest ICT industry on the world, but the most productive appropriation of ICT which can be supported by sensitive technology politics and lead to social inclusion in Europe.

1 Introduction

In the work domain technological change has been dramatic during the last two decades. As the implementation of ICT has generally been accompanied by a restructuration of organizational processes, the division of labour has been affected by ICTs (= applications of ICT). After ICT diffusion and adoption in information- and knowledge-intensive areas of work, ICTs started to gain more and more importance also within work realms, where its adoption is not that obvious (for example, agriculture and fishing, manufacturing, mining and construction, to name only a few). Nowadays it is hardly possible to find an area of work, in which ICTs are not of any relevance in one way or another.

During the last three decades, ICT-based industries and services have rapidly grown. With ICT, the way in which companies gain, process, store and distribute information and knowledge has changed. Organizational processes in companies have been re-engineered, for example, when implementing knowledge management (KM) systems, Enterprise-Resource-Planning (ERP) systems, or eLearning platforms. Moreover, the division of labour within or between organizations (which has been growing even before the arrival of digital ICTs) was supported by ICT applications. Prominent examples are inter-individual, inter-group or inter-organizational tele-cooperation, industrial clusters and company networks, virtual teams and organizations, and off-shoring.

Changes and developments in ICTs are thus correlated with transformations of work forms in European countries. In return, they are accompanied by changing demands and requirements placed on workers, among others, with regard to their qualification and skill level. Therefore, the diffusion and use of ICTs in the work domain raised questions about its impact on the quality of work in Europe (defined by the Eurofound as ensuring career and employment security, maintaining the health and well-being of workers, developing skills and competencies, and reconciling work-life balance), which are discussed under the label of the "Information Society".

There is much empirical evidence concerning the high extent to which ICT permeates the European work domain as well as evidence of transformations of work processes in Europe. What were the transformations in the work domain and how were they related to the advent of ICT? In order to discuss these questions empirically, we first have a look at the epochal trends which occurred in the course of the 20th century and which have been extensively discussed within the discourse on the transformation of work. Secondly, we contrast the historical visions about the development and the implementation of new ICTs with empirical evidence of their practical outcomes in the work domain.

We show how "telework" has been used to conceptualize the implementation of ICTs in the work domain. However, related research has been criticized for having only a limited view on the work domain, as, for instance, working forms such as tele-cooperation are not covered by the concept of telework. Therefore, eWork has been proposed as a broader analytical lens. We present related empirical evidence and discuss it in relation to working forms and working conditions. We summarize direct health effects of ICT-related work, which have been identified by research in work-psychology, work organization or work ergonomics. However, our focus on the social impacts of ICTs is on collaboration opportunities and practices within the work domain under a special perspective on job-related roles and competence development.

We further extend the scope of our research by pointing at the partly hidden nature of ICTs. Research categories such as ubiquitous computing, for instance, explicitly aim at the integration of ICTs into everyday tools and artefacts. Successful implementations of such ICTs are not covered by the concept of eWork. We plead for further methodological efforts and, therefore, also take case studies into account when discussing the four core themes of

the conceptual framework: rationalization, networking and social capital, empowerment and participation, information and life-long learning in the subsequent part. We close with some policy implications derived from our analysis.

2 Epochal trends and the arrival of ICT in the domain

In this chapter we describe important socio-economic trends and changes in the European work domain in the course of the 20th century which all predict de-industrialization in one way or another. We begin our historical review of main transformations in the work domain in the late 1960s. Trends of that time were, among others, analysed in the theories of "post-industrialism". We describe related tertiarization trends, but also point at dangers of the "post-industrialism" paradigm.

Afterwards, we switch to the emergence of new management and organizational practices in the late 1970s and 1980s, which were discussed under the label of post-Fordism. As a next contribution, the conceptions of the "Information Society" (and subsequently conceptions of the "Knowledge Economy"), which came along with the emergence of the World Wide Web in the 1990s, will be discussed.

Thus we perform a selective description of some prominent visions and ideas which came along with the diffusion of ICT in the work domain. The discourses and visions that we present substantially shaped the expectations upon ICT and its impact on work during the respective time periods. We close our review with a first summary of the most important research topics, which are currently discussed with regard to the social impact of ICT in the work domain.

2.1 De-industrialization of work?

In addition to the considerations on the relationship between technology and society presented in the project's conceptual framework, the following sub-chapter introduces some of the most prominent scientific discourses which have most intensively dealt with transformations of work and employment in modern industrialized societies after the Second World War. The selected three discourses (post-Industrialism, post-Fordism and Informationalism) have in large part dominated the scientific and public debate about the future development of work and employment in the OECD countries. To some extent, the present discussion in international policymaking under the label of the *information/knowledge society* or *information/knowledge economy* can be traced back to these three discourses.

What they have in common is that they

- examine the socio-economic transformations of society in terms of technological and/or organisational innovation;
- assert a decline of the industrial society and a transition to a new economic and societal structure;
- describe these socio-economic transformations as equally severe to the replacement of the agrarian society through the industrial society;

The different considerations on the impact of technology on work, which have emerged within these scientific discourses, are generally based on the assumption of a technology-driven de-industrialisation of modern societies. Thus, individually, they prove not to be entirely appropriate for explaining either what has been expected to be "the great transformation" of modern society in the "Information age", or the actual specificity of social changes in the work domain. However, each of the conceptions presented here has pointed

to new paths of development in modern society, of which some have persisted over time and are still of relevance when inquiring the transformative potential of modern ICT. Hence, these scientific discourses present a broad set of disparate and individual historical phenomena, which can be used as basis for a summary of the epochal social trends of the work domain. Merging the findings of the independent discourses, the epochal social trends of the last 25 years in the work domain are thus preliminarily described by the following trends:

- *Information and knowledge* as a new economic resource (instead of capital and labor)
- The *tertiarization* of work (decline of manual work in favor of service work)
- The emergence of *new conceptions of production* (such as lean production, individualized mass-production, global sourcing with offshoring and outsourcing) and, respectively, the emergence of *new forms of work organisation* (such as flat hierarchies, temporary contracts and self-employment)
- The erosion of traditional forms of work (such as full-time employment, one-life-one-firm relations and enduring contracts) in favour of the *individualisation* of work (increasing flexibility and autonomy of work)
- The *informationalisation* and *computerisation* of work as an increasing use of ICT at work.

These trends seem pretty much inter-related with the major trends of contemporary society presented in the conceptual framework. Processes of work flexibilisation are, on the one hand, straightly related to trends such as increased time autonomy and individual mobility, with potentially positive impacts on the quality of work. On the other hand, many scholars associate work flexibilisation with a “re-establishment” of Taylorist forms of work organization as a consequence of the developments in ICT. Furthermore, there are, at the same time, trends contrary to individualization, e.g. standardization and certification. It is very difficult to identify and analyse general causal relationships between ICT use and social change in the work domain.

For an appropriate analysis of the social impact of ICT on work, it is necessary to abstain from generalizations and base conclusions on empirical evidence. The discussion of “epochal trends”, which is conducted in the following, is to be seen as an overview of the thoughts prevailing in the respective time periods. Whether parts of them have become reality has to be subjected to empirical validation.

2.1.1 The post-industrial society

Information and knowledge as a new economic resource and the tertiarization of work

The discourse on the post-Industrial society has been mostly shaped by the analytical work of the sociologist Daniel Bell (1976), who pointed to the growing importance of the emerging information sector in opposition to the declining industrial production of goods. Bell claimed that the transformation from an industrial society into a post-industrial society would be performed by a fundamental shift from an economy producing goods into a service economy. In this view, industrial and manual forms of work would progressively disappear and knowledge and information would become a new added value with a crucial impact on productivity and growth.

In contrast to economically deterministic approaches, Bell adopted a view on social change, which aims at taking a diversity of factors into account. According to him, a combination of so-called ‘axes’ of organisation in industrial societies is changed at the same time, eventually leading to a shift especially with regard to the economic structures. While in the industrial society the production of goods is based on privately owned means of production, which are

managed in a rather hierarchical manner, he saw the post-industrial society characterized by the importance of the information sector. Because intelligent technologies become the most prominent source of innovation, **information and knowledge replace machines as the precedent factors of production**. Accordingly, Bell suggested science to move into the centre of attention. Ever further expansion and differentiation of knowledge provides for economic and technological growth in a mutual way. Particularly, services become the preferred realm of economic activity, because many of them are deemed to be conducted through the use of ICTs (Bell, 1989).

Today, in many statistics jobs in the service sector have overcome those of material production, but the concept of service itself is very heterogeneous (Huws, 2003) and thus problematic (Basso, 2003, p. 102). For instance, many former management, administrative or research enterprise roles have become outsourced and declared as "service". Furthermore, although there has been a considerable shift of manufacture jobs from the most to less industrialized countries, still a huge number of jobs even in G7 states are industrial ones (Banister, 2005, p. 11). Measuring the truth value of Bell's theory, which was developed in the 1970's, contrary to his predictions, the industrial sector cannot be said to have disappeared. Instead, critics have pointed to developments in the service sector, which rather show a 're-industrialization' of services, which means, particular services are replaced by industrial products (Gershuny & Miles, 1983). Furthermore, as ICT-based services depend on the production of the respective devices, increase in this realm reinforces growth in the related hardware production. **What can be observed is rather a blurring of boundaries between the industrial and the service sector, since nowadays many industrial products contain service activities. Moreover, not only services are provided by means of ICTs, but all sectors are increasingly penetrated by the use of information and knowledge-related technologies.**

Notwithstanding the actually increased importance of knowledge and information, it might reasonably be doubted whether they really constitute the driving force behind economic development and replace material goods (which is more than enhancing them). Knowledge and information have played major role since the Industrial Revolution. Research shows that even in the case of ICT, its introduction was dominated by conventional economic principles of profit maximization and competition and not by systematic gathering of information or knowledge assessment alone (Werle, 1990 and Kubicek & Berger, 1990).

While unquestionably knowledge and information have become crucial factors of production in contemporary society, it might well be challenged whether this change justifies the sharp distinction between an "industrial" and "post-industrial" society, even the more if the latter is already taken as an appropriate description of today's situation. Leaving this dichotomy behind but at the same time being aware of the transformative capacity of ICT on work certainly constitutes a more appropriate way of analysis.

2.1.2 Post-Fordism

The emergence of new modes of production and new forms of work organisation, and the erosion of traditional forms of work

The term "Fordism" represents a model for the system of developed capitalist countries in the post-war period, in which economic development was characterized by mass production and mass consumption. It is a concept which comprises economic as well as social and institutional structures. The main tenets are a Keynesian regulatory policy, social expenditures, standardised goods and economies of scale.

On the level of individual companies, the organisation of labour strongly built on principles developed by Winslow Taylor, which are commonly known as *Scientific Management* or in short: *Taylorism*. This approach was mainly based on four principles: The priority of mental

work over manual work, the complete separation of both from each other, a strong division of labour, and a system of incentives which was meant to increase productivity. While these four pillars were constitutive, concrete implications for the organisational structure were claimed to be based on empirical research. The overall aim of this concept was to overcome natural forces as well as the allegedly 'evil' nature of man by means of technical solutions. The latter were sought to be achieved by 'scientific' analyses by detailed descriptions of work processes and the adoption of work forms which proved to be efficient in terms of maximum output at a minimal effort. The practical implementation should take place in a hierarchical manner, thereby giving control priority over individual motivation (Merkle, 1980).

Since the late 1960's and the 1970's, a number of circumstances occurred, among them market saturation and the Oil Crisis, which eventually paved the way for the installation of new economic and social patterns. This interim period was described as the "crisis of Fordism", since well-established patterns were not only put into question but were actually replaced by different ones intended to tackle the prevailing problems.

Accordingly, the subsequent time was labelled "post-Fordism" and is to a great extent defined by demarcation from the previous period, as illustrated in the following table where the main features of both approaches are compared by Rustin:

Table 1: Fordism and Post-Fordism

low technological innovation	accelerated innovation
fixed product lines, long runs	high variety of product, shorter runs
mass marketing	market diversification and niche markets
steep hierarchy, vertical chains of command	flat hierarchy, more lateral communication
Mechanistic organisation	organismic organisation
vertical and horizontal integration, central planning	autonomous profit centres, network systems, internal markets within firms; outsourcing
Bureaucracy	professionalism, entrepreneurialism
mass unions, centralised wage-bargaining	localised bargaining, core and periphery work force divided, no corporation
unified class formation, dualistic political systems	Pluralistic class formations, multi-party systems
Institutionalised class compromises	Fragmented political markets
standardised forms of welfare	Consumer choice in welfare
Prescribed 'courses' in education	credit transfers, modularity, self guided instruction, 'independent' study
standardised assessment (O level)	Teacher-based assessment (GCSE) or self assessment
class parties, nationwide	social movements, multi-parties; regional diversification

Source: Rustin (1989)

While in the "Fordist" era state intervention, standardised products and large corporations were integral features of the organisation of labour, "post-Fordism" is being defined by privatization, complex and individualized products and a process of downsizing and decentralisation of companies. In this context, major social changes concerning the work domain are seen in an increase of work flexibility and work autonomy. Since the 1970's new forms of work organisation such as part-time work, temporary contracts, self-employment and home work started to emerge and were in some cases interpreted as signs of the erosion of traditional work forms (e.g. full-time employment, one-life-one-firm relations and enduring contracts).

In the academic discussion, the approach of "post-Fordism" has been widely debated and nearly all assumptions and conclusions have been put into question. Nevertheless, there have been changes in the European work domain and its microeconomic regulation, which apparently are not in line with principles of the period described as "Fordism". In this respect, developments regarding the size and structure of enterprises and the differentiation and flexibilization of individual work need to be mentioned. For an analysis of the social impact of ICT on work, these developments need to be kept in mind.

2.1.3 The conceptions of the Information Society

The informationalisation and computerisation of work

As already described in the report's conceptual framework (see p. 7-10), traditional approaches to the explanation of the development of societies tend to assert a causal function to the means of production. In this view, ICTs are seen as such, because their versatility makes them enablers of a diversity of production processes. Accordingly, the spread of information technology is suggested to impact all other aspects of society in a decisive way. Especially because of expected economic returns, ICTs are implemented in numerous production-related contexts, and, in turn, generate far-reaching socio-economic changes. The crucial difference between the information society and the industrial society is seen in this penetration of production by ICT. In this "technology push approach", technology is regarded as developing independently of the society and as impacting on the latter in a revolutionary way.

This linear perspective on development has been criticized by the sociologist Manuel Castells (2000). He pointed to the fact that societies do not follow a linear path by means of an external factor decisively impacting on human action. A central difference of his approach is that particularities of local cultures, institutions and practices are preserved and integrated in the development of the information society. The impact of technology does thus not occur in a deterministic way but is rather complementary to the general increase of the importance of information. Thereby, information is not in itself a driving force for social change. Rather, for innovations to occur, it depends on the appropriate application of information through which new information can be successfully established, processed and communicated.

Castells suggested to see not ICT, but *information* as the central source for change in the information society and, correspondingly, to prefer the label "informational" over "post-industrial"¹. What has changed, he claims, is the mode of development impacting on the quality and level of surplus. It is essentially characterized by the possibility of information to be manipulated by information to produce information: "... what is specific to the informational mode of development is the action of knowledge upon knowledge itself as the main source of productivity" (p. 17). Information was already an important source of productivity in the industrial society, but the main difference is simply determined by a new quality of information and knowledge.

Instead of differentiating between an industrial and a post-industrial mode of production, Castells suggests using a framework of two forms of production cross to the differentiation between industrial, agrarian and service production. He sees the turning point between the two forms located around the year 1970, and characterized primarily by the spread of information technology to all social and economic sectors. The new form of production required the establishment of a technological infrastructure for the development of a global economy. Within each form of production, changes occur regarding the relative weight of the economic sectors (industrial, agrarian and services). Contrary to considerations of "post-industrialism" Castells does not see the industrial sector in decline. Although undisputedly services account for the highest share of employment in modern societies and make up the largest part of the respective GNP's, Castells emphasizes that the industrial sector is by no means vanishing. Castells also points to the unclear definitions of "services".

Castells also challenges the common notion of information societies to become polarized societies, with increasing numbers of unskilled workers on the one hand and only a few leading positions on the other. Although he acknowledges the increase of low-paid jobs, he contrasts it with a higher growth of leading and expert positions. A crucial feature of the

¹ cf. section 2.1.1

information society is then, accordingly, a new occupational structure, which is reflected not only on the level of the individual worker but also in the setup of organizations and corporations. While the science system certainly plays a key role in the production and distribution of knowledge, it represents not the only way in which information appears. Rather, specific forms of contextual expert information, such as functional technologies, intelligence, implicit knowledge or knowledge-based forms of operation become the basis of a knowledge economy in the information society.

The distinction, made by the philosopher Michael Polanyi in the early 50's, between "tacit knowing" and "explicit knowledge" has attracted much attention within organization and management science research. Polanyi (1966) showed that the human beings' ability to carry out complex tasks depends much more on the use of "tacit knowing" (in contrast to "explicit knowledge"): tacit knowledge cannot easily be codified and formalized (for example by being written or verbalized). "Tacit knowing" is knowledge that literally sticks to the individual, although it may be essential for the successful achievement of practical collaborative tasks.

Tacit knowledge has become an important issue for "learning organisations", which are characterized by incorporating both the *use* and *generation* of knowledge. The main challenge of an "learning organisation" is, then, to organize transitions between "implicit" and "explicit" knowledge in a productive way. This requires organisational structures that support "organizational learning" and the appropriation of "organizational knowledge".

On the other side of the coin, "organizational knowledge" is, of course, not to be separated from individual human beings. While knowledge might somehow be "saved" in the structures of an organisation, successful application of this type of knowledge is dependent on the appropriate connection of organisational and individual learning processes. And such learning processes are dependent on the existing codifications of knowledge. This has become a major question of Knowledge Management.

In this context, a very specific focus on learning was developed around the conceptions of Communities (CoP) or Networks of Practice (NoP), which will be described in chapter 4.2 in more detail. Related research showed that transforming individual tacit knowledge into a general explicit form is not a necessary precondition for sharing it, but the codification of experience within (sub-) culturally codified (quasi-general) forms is indeed. A lot of practical learning is based upon mimicry, try-and-error and story-telling instead of deductions from explicit knowledge, but may nevertheless efficiently support the appropriation of scientifically designed environments.

In a similar vein, drawing upon the rethinking of Nonaka's (1991) differentiation between codified and tacit, contextual knowledge, which he had undertaken together with Enzo Rullani (2004), Bettacini (2004) concludes: „We know that all real production processes involve a mix of codified knowledge and contextual knowledge. Even the most automated of them display gaps that require the intervention of practical, contextual knowledge if they are to continue. On the other hand, it is certain that there is no concrete artisanal production process – which would appear to be the locus of contextuality – which is not based on routines and devices that embody codified knowledge.“

On the individual level, the occupational activities of the information society are said to represent new forms of *expertise*. Especially *business consulting* and *knowledge management* become prominent forms of expertise work. Besides possessing context-sensitive expert knowledge, *knowledge workers* (Drucker, 1993) also need to have social skills to successfully communicate the relevant information. It needs to be pointed out another time, that the knowledge at stake here is different from canonical forms, knowledge of the natural sciences, for instance, because it relates to changing situations.

Taking such contextual knowledge into account allows for two different operations: identifying know-how elements (beyond "knowing-that" ones, see Ryle, 1949) in all human activities, or

identifying new jobs based upon specific contextual experiences. In discussions about the information society and the knowledge society this differentiation is often too little respected - with considerable consequences: seen from the first perspective, everybody is (increasingly?) a *knowledge worker* and the information society represents the ideal of a society which supports the creative potential of all its citizens. Instead seen from a historical, empirical perspective, the identification of emerging new expertise roles such as Robert B. Reich's (1991) "symbolic analysts" (for instance, ICT-consultants) covers a socially much more limited field. Anticipatory and empirical uses of words must not be confused and human-factors research differentiated according the knowledge axis. It is striking that research on knowledge workers in Europe (see for instance Eurostat, 2008, pp. 25) has used established instead of new criteria and still found only a marginal share of related jobs.

In the field of Knowledge Management, it has today become understood that (and why) the early visions of Knowledge Management failed, which saw a central storage for knowledge with general just-in-time accessibility as a panacea: data stores may only contain explicit knowledge, which furthermore requires specific codification. Accessibility of knowledge turned out to be much more than a technical problem, although the impact of the technical mediation is important, too, in practical cases. The reductionism of the early expectations is no argument against related ideals (on the contrary), but an indication of the related complexity involved: today experts advocate "second-generation Knowledge Management" to be based upon adaptable technologies on the one hand, and a sound understanding of the individual application cases, on the other.

2.2 Dystopian/utopian visions that shaped expectations in the domain

Drawing on the academic and public discussions shaped by the three discourses, presented above, several dystopian and utopian visions with regard to the work domain have been connected to the introduction of ICT. Different scenarios of the future of work were drawn which had particular socio-political implications and played a role in the allocation of research funds in the past. In the following we present a few prominent examples which shaped the expectations regarding the transformative potentials of new ICT in the work domain.

"Capitalism without work" and the substitution of human work by machines

Based on the assumption of an unprecedented productivity boost caused by the implementation of ICT in the work domain, on the one hand, the industrial sector was assumed to gradually disappear. Workers employed in this sector were expected to become unemployed with the result of a "capitalism without work". This idea was especially prominent prior to the introduction of digital ICTs during the 1970s period of economic stagnation. On the other hand, also the allegedly positive impact of ICT on the work domain has been greatly exaggerated. Taking the full realization of ICTs potential to replace certain traditional forms and ways of work for granted, various ideas regarding 'future' workplaces were developed mainly during the 1980's. At that time, ICT was being implemented in many domains and the partly visible effects lead to speculations about future developments.

Among these visions were concepts that aimed at a completely computer-driven work domain (the "automation of automation"), that means, factories disposed of any human work. One related concept was the "Computer-Integrated Manufacturing" (CIM) which did not only refer to production, but also took product design, anticipation of the division of labour, quality assurance and corporate statistics into account. Each of these steps was to be supported by means of ICT. Especially by establishing a physical network link between distributed means of production, production-related efficiency was supposed to be enhanced significantly. Furthermore, management processes and other administrative tasks were to be supported by means of computer technology (Harrington, 1973).

In contrast to these models, which often adopted a technical account on production and were directed towards the minimization of human work, there were other approaches that aimed at supporting social work processes.

"Industrial Democracy"

From an interdisciplinary perspective, "Computer-Supported Collaborative Work" (CSCW) tried to take into account both socio-cultural and technical factors. This way, empirical research in work environments should in particular reveal informal rules, which then constituted the basis on which the development of *Groupware* and *Workflow* systems was founded. In order to build an appropriate technical infrastructure, knowledge of these informal rules was emphasized in addition to official rules and hierarchical structures (Grudin 1994, Schmidt & Bannon, 1992). Industrial relations between workers and the management were studied under the focus of the related impact of ICTs. The greater availability of information was seen as a possible contribution to the development of "Industrial Democracy". However, CSCW approaches remained sceptical to utopian or dystopian thinking and positioned themselves relational to the actually existing work and consumption situation.

"The Paperless-Office"

Technological development projects were often related to product visions. One example, which was rather related to individual workplaces, was the ideal of the "Paperless Office". As information was thought to be increasingly available in a digital form, the need to have information "hardcopy" was deemed to vanish, with books to be replaced by E-Books, conventional mail by E-Mail and journal articles by their electronic counterparts (cf. Business Week, 1975). The idea came up with the development of the personal computer, which was anticipated to be available on every desk, with the automation of standard office tasks to be the consequence. There really has been an increase of ICT use in publishing ("desktop publishing"), but since the uptake of ICT, paper use has also increased: the worldwide use of office paper is estimated to have doubled from 1980 to 2000 (cf. The Economist, 2008).

"First generation Knowledge Management"

As already mentioned, a first generation of Knowledge Management systems in the early years was characterized by expectations that the implementation of a central data store (or knowledge repository) in a company was an attractive means to make existing knowledge accessible to everybody in an organization, and could be used as a source for innovations. The difference between data, information, knowledge and experience and the importance of socio-cultural factors such as individual commitment and motivation to exchange information became visible only later (Brown & Duguid, 2001). Knowledge Management was first reduced to be a merely technical issue, based on the assumption that individual knowledge and experience could be codified by means of ICT. This allowed for large expectations (and investments), but hindered necessary steps to be taken for Knowledge Management to be developed further (Huysman & Wulf 2005; Ackerman et al., 2003).

On the one hand, many technology-based utopian or dystopian visions of the past have become obsolete in the mean time. On the other hand, a closer look sometimes reveals that they shaped the further development path not as naively as it later appears, from a long-term historical perspective. However, although visions often contribute to a mobilization of efforts and investments for a certain purpose, it remains important to be aware of the danger that these visions may become obsolete due to new findings. Such awareness allows for a re-arrangement of goals and efforts, but opportunities to learn from failures are not at all self-evident: they need to be actively and critically re-constructed against the trite "certainties" of utopian (or dystopian) visions, which may become ideologies if not perpetually confronted with empirical evidence.

2.3 Contemporary issues in Europe

In a certain understanding, a great part of the visions that were formulated as the identification of “epochal trends” can justly be said to have been “historically disproved”. Neither the “Paperless Office” nor “Computer-Integrated Manufacturing” has become reality the way in which they were initially intended. Although high unemployment rates are certainly experienced as a problem, the situation is still far from approaching a society correctly described as “capitalism without work”.

On the other hand, the visions related to the implementation of ICT have remained important. Among others, they have shaped related attitudes and strategies. For instance, both the “Paperless Office” and the “Computer-Integrated Manufacturing” still describe a scenario, which allows a related analysis of factual developments. Furthermore, analyses of the social construction of technology visions and their role in the innovation process can be a basis for drawing related consequences for the organization of technological development. Therefore, such visions should neither be confused with pure speculation, nor with empirical reality.

With regard to the forms of work, a lot of phenomena have been discussed in Europe, among them:

- job creation,
- new knowledge-based professions and occupational roles,
- new knowledge-based opportunities for existing jobs,
- knowledge-demands related to new professions or new work forms,
- work intensification and diversification,
- competence certification,
- work-related stress,
- work control and privacy,
- information overload,
- work-life balance,
- qualification and informal life-long learning,
- the aging workforce, elderly people,
- exclusion processes in the work domain.

This list is everything but complete. In our report these issues are discussed in the very general perspective of a changing character of work and working conditions. In this context, we address the quality of work according to the Eurofound definition as related to career and employment security, the health and well-being of workers, the demand and supply of skills and competencies, and work-life balance.

In order to delve into these contemporary issues more in-depth, the subsequent chapter performs a thorough analysis of the application of ICT in the work domain. In a first step, the different applications of ICT are classified. In a second step, the different application areas are discussed. The last part gives empirical evidence on the distribution and usage of the formerly discussed application categories.

3 Applications of ICT in the domain

3.1 ICT and ICTs

ICT may sometimes be perceived as incorporated in the modern PC, but it is, of course, elder and broader. While even before any computerization, there were efforts dedicated to technically support the exchange of information and communication, after the invention of the computer, there was a time of large mainframe systems which dominated the time before the modern PC. Drivers of this technological innovation were large organizations which expected rationalization effects in administrative and service work. As mentioned before, the detection of rationalization potentials in areas that had not normally been in the focus of restructuring strategies, such as the finance and insurance sector, led to high expectations.

However, contrasting visions of technology with empirical effects, the latter often show that factual practical outcomes of technological innovation may be pretty different from the expected ones (in spite of this, technological visions remain of considerable importance when organizing technological programs and projects). Brynjolfsson & Hitt (2003), for instance, show in their analysis that ICT on the short term contributes to output growth instead of productivity growth, but under certain conditions such as "complementary organizational investment", it may affect long-term productivity growth. Such considerations showed the need for differentiation related to contextual factors. But how can one differentiate ICT in the work domain?

One way to differentiate ICT is to group it according to the major functionality expected (which may, to a certain degree, differ from the functionalities practically used). For instance, **material and human resources** can be organized by means of Enterprise Resource Planning systems (ERP). Material Requirement Planning Systems (MRP) can support the specific planning of material resources. And if knowledge is counted as an economic resource (see Drucker, 1993), Knowledge Management systems (KM) could appear as systems to manage these type of human resources.

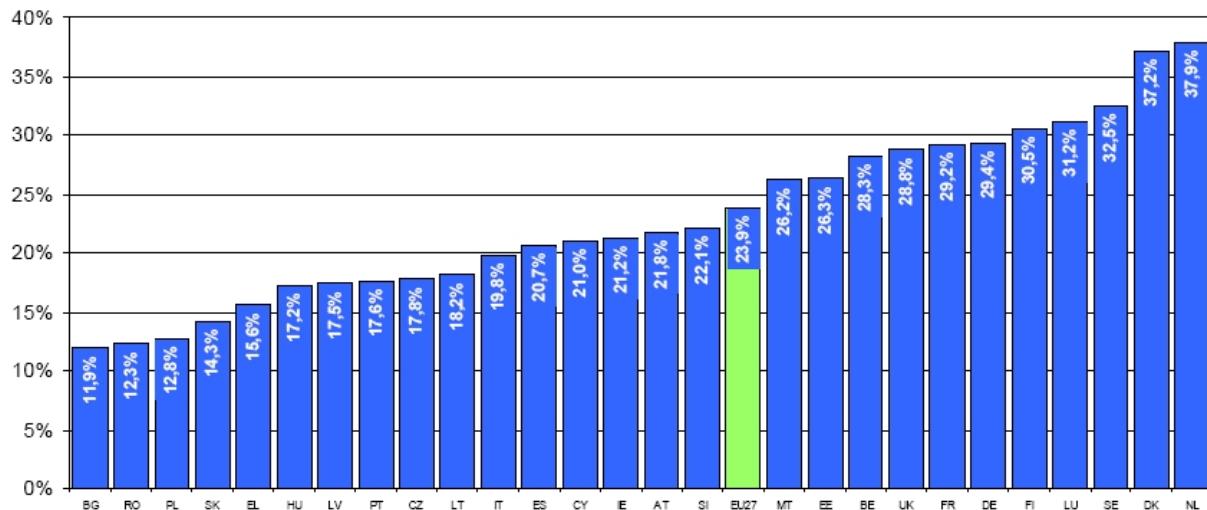
Still there are further **systems for work organization** such as content management systems (CMS), electronic data interchange (EDI) and communication systems, and others. This shows that even the conceptualized systemic frame of information integration differs among ICT systems in the work domain. In practice, different functionalities are often combined and adapted to situational demands, for instance, in intranets or specialized groupware. The information-integration potential of ICT is in practice confronted with shifting, overlapping and conflicting institutional, habitual and technological situations (Suchman, 1987).

If one distinguishes ICTs along the actor roles addressed, one finds different types of **applications for the interaction** between business and customer (B2C), for inter-organizational relations among business organizations (B2B), or systems to support interaction between customers (C2C). While customer-relationship management systems (CRS) are to improve B2C, in the emerging field of Web2.0 applications a certain shift of focus from B2C to C2C can thus be identified. However, for many types of ICT in the work domain, this differentiation does not make much sense.

Another differentiation is the one between a **technical infrastructure (ICT) and the applications (ICTs)** that run on it. Regarding a personal computer, the combination of hardware and the operation system as infrastructural software make it a sort of open infrastructure which allows the user to run specific application software. Regarding a network, the infrastructure may consist of the computers, the connections and the network and operation systems. Even if the differentiation is context-dependent, as applications may combine different infrastructures and infrastructures may integrate specific applications, in a concrete case, it helps to identify the technological structure at stake.

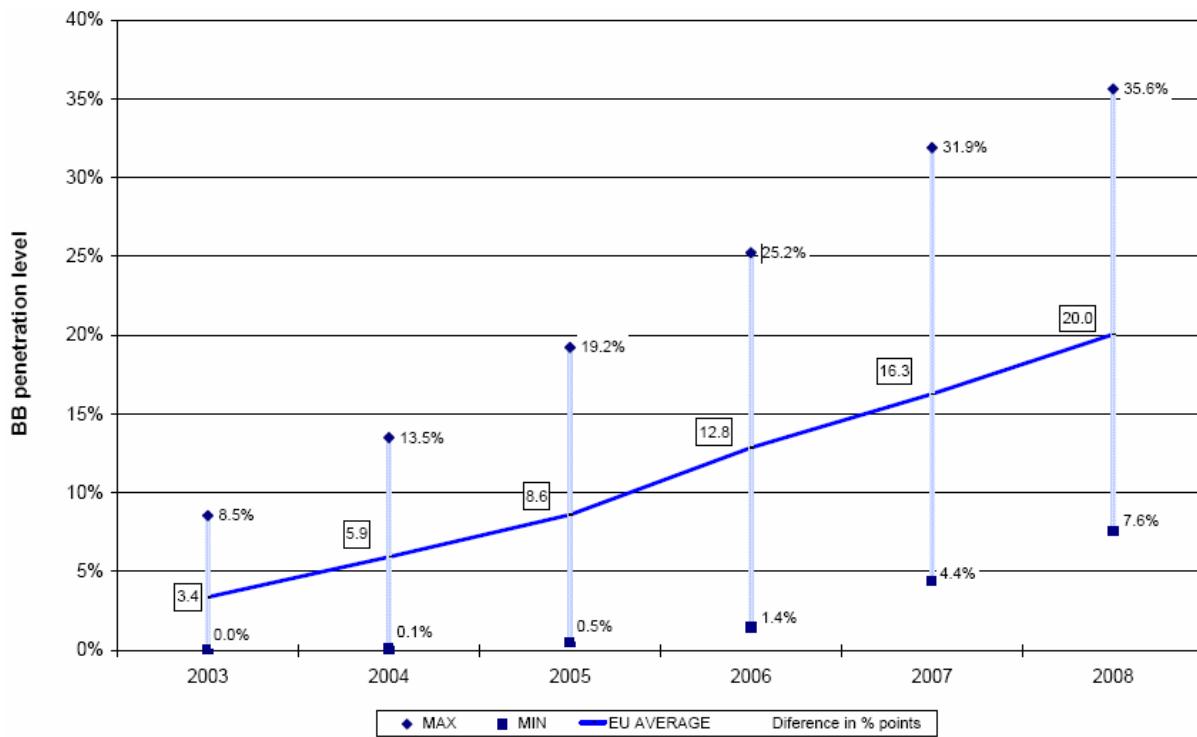
With regard to technical infrastructures, remarkable success has been made in the European Union, fostering internet and broadband access, see, for example, table 1.

Figure 1: EU Broadband penetration rate- BB lines per 100 population (July 2009)



Source: EC services based on COCOM data

Figure 2: The gap in broadband penetration in the EU



Source: EC services based on COCOM data

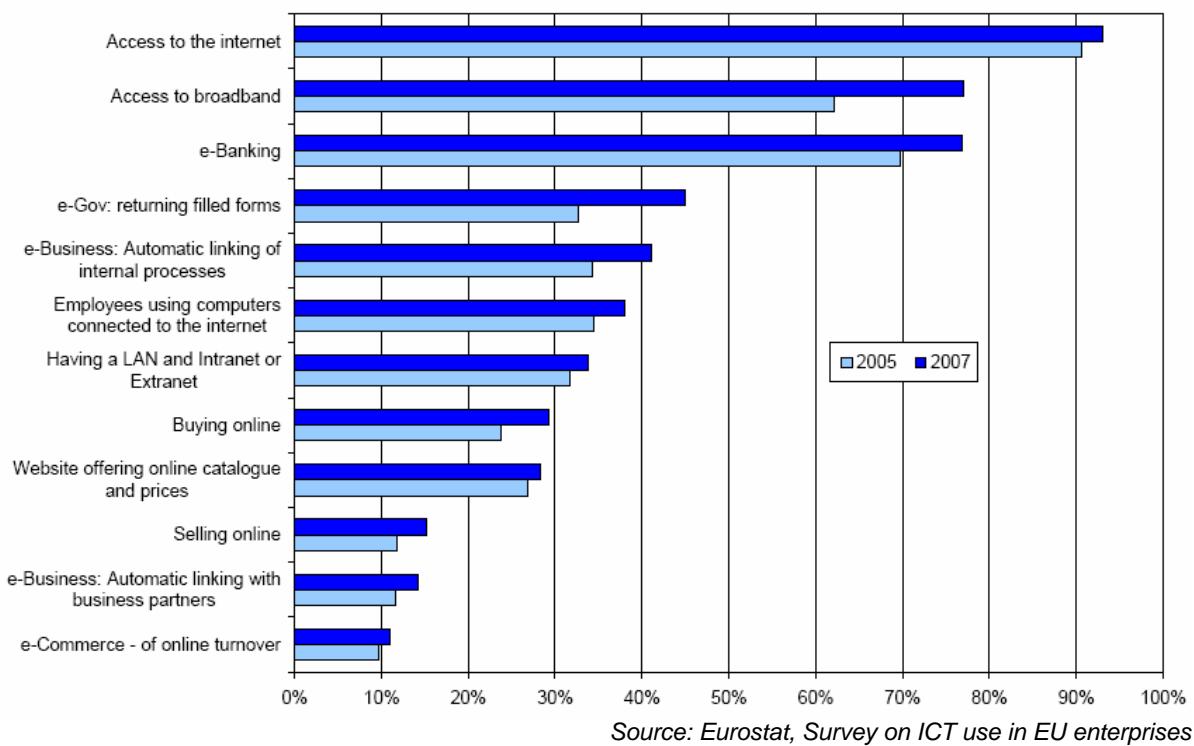
Nevertheless, despite the average broadband penetration rate, statistics show that there are quite large differences in broadband access – seen as one central infrastructure index – between different member states (see figure 2). The gap in broadband penetration within the European Union remains quite high with 28 percentage points in 2008.

The Commission Staff Working Document SE (2008) 470 states that, by 2007, 77% of all businesses had a broadband connection and were using the Internet for dealing with banks. Online selling is reported for only 15% of all enterprises; even less have established

automatic links with their business partners due to interoperability, standards issues and legal concerns. Geographic differences in ICT take-up across Member States are becoming increasingly evident. A comparison of average take-up levels across countries shows that they range from 27% to almost 59% (in 2007), with the degree of fragmentation remaining basically constant over the period 2005-2007. Applications for the automatic exchange of information inside enterprises are now practiced in more than 40% of EU, mainly large enterprises. The use of ICTs for transactions with business partners is still limited to a small subset of enterprises.

In this context, the Commissioner for Information Society and Media, Viviane Reding, announced in 2006 that "Europe is already investing more than 1 Billion Euro per year in ICT research. This must increase further, but so must our efforts to improve economic competitiveness by innovative use of this technology in all sectors of the economy" (Reding, 2006).

Figure 3: ICT usage in enterprises 2005-2007 (EU average)



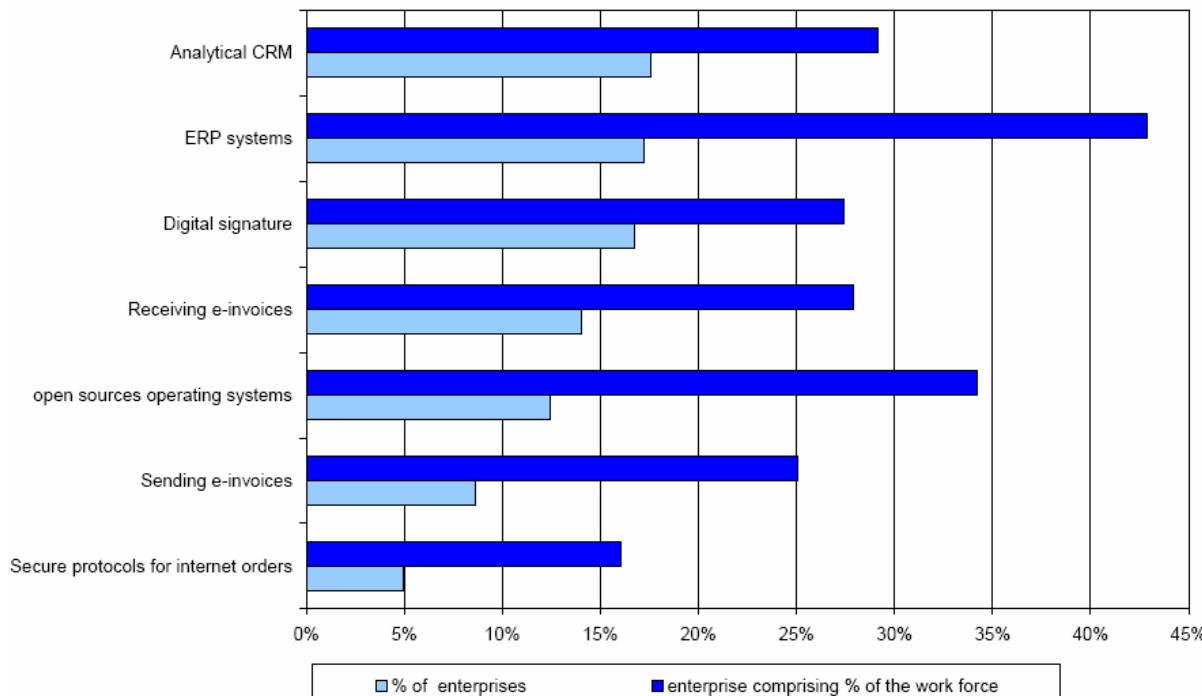
If one asks about the impact of an infrastructure, it might be inaccessible, unreliable, slow or expensive. In contrast, the impact of applications does not only follow general characteristics such as in the case of infrastructures, but has its own characteristics. The specificity of the impacts of an application does not imply that those had to be less important than the more general impacts of infrastructures. For example, E-Mail helps people to stay in touch by sending text messages. To have access to this particular application may be much more important than to have access to a faster infrastructure. The same can be true for applications in the work domain, such as those examples mentioned above.

Better infrastructures can make work more efficient, for instance, when downloading becomes faster due to a more advanced network. Related increases in efficiency can support new applications, which may again contribute to faster performance. However, automation is only one possible side of technological change. The other side is the emergence of new technologically enabled applications, which allow for new forms of effective work. In this context, one can distinguish between labour-substituting and labour-supporting ICTs. (To give a (non-ICT) example for the latter: there would be no film industry

without the film, however, the film could have been invented without a film industry prospering).

Following statistics shows some of the most used ICT applications in European enterprises. In 2007 especially the use of analytical CRM systems, ERP systems, and electronic signature applications has increased on a level of more than 15% of European enterprises (see figure 4).

Figure 4: ICT use in enterprises in 2007 (EU average)



Source: Eurostat, Survey on ICT use in EU enterprises

Since all forms of applications are dependent on specific infrastructures and because applications can be used for heterogeneous purposes, one cannot say that infrastructures are just related to automation, while applications contribute to a creative enhancement of human potentials. Nevertheless, if a strict focus on general characteristics, as they suffice to describe infrastructures, prevails, the special characteristics of applications are not taken into account. This makes the danger of a reduction of innovation to labour-replacement imminent. ICTs can be very different and have different impacts. Therefore, one must not lose sight of ICTs when discussing impacts of ICT.

The complexity described above makes it understandable that a lot of studies on social impacts of ICTs focus upon easily identifiable phenomena. For instance, access to computers and the internet have been investigated as indicators for technological change. Related studies unveiled the danger of e-exclusion for those who cannot access such technology (the European Commission has taken up this issue and imposed measure for e-inclusion). As another indicator of technological change, the spread of telework has been studied.

3.2 ICT and new forms of work

Telework

One of the most often mentioned ways in which ICTs have impacted on the way people work is by enabling individuals to choose the place where they work more freely. Forms of work that fully exploit this potential are referred to as telework. This new concept of working was very prominent in the 1980s and 1990s in the discussion on flexible organisational structures (Malone et al., 2003).

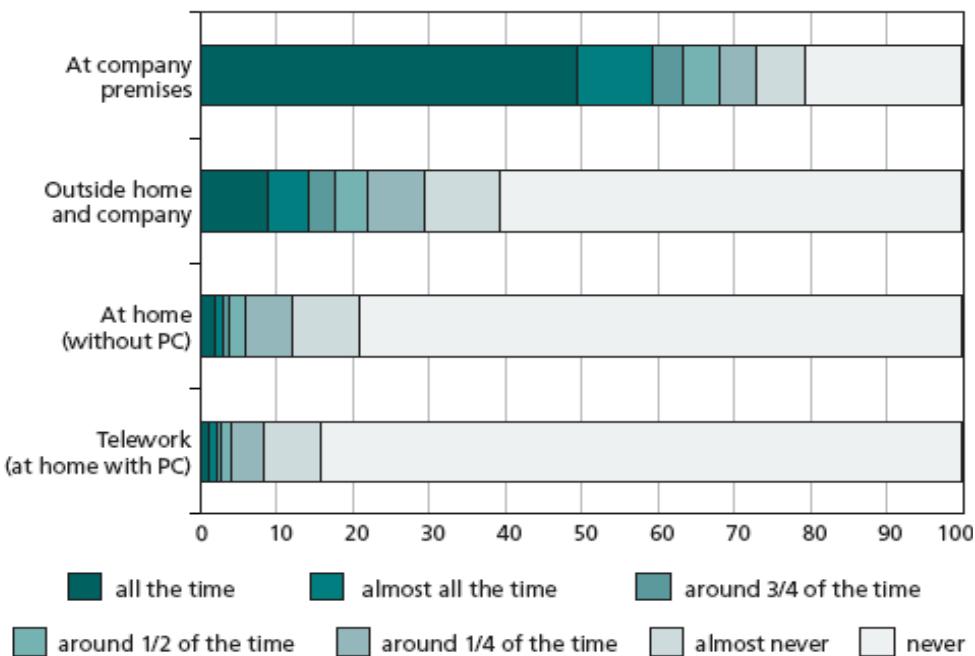
One of the few European countries for which good data on telework exist is the UK. From questions asked in its labour force survey ONS, the **UK National Statistical Institute**, we can derive that in Spring 2005, 2.1 million people in the country were working mainly from home (or using home as a base) and were only able to do so because they used both a telephone and a computer. Using this definition for telework, the proportion of the workforce who teleworked increased from 3% of the total workforce in 1997 to 7% in 2005 (ONS, 2005).

Comparable cross-country data on telework is provided by the **European Working Conditions Survey** (EWCS), which is conducted on behalf of the European Foundation for the Improvement of Living and Working Conditions in 2005. Figure 5 presents data for the whole sample (EU27) on the working time spent at different locations.

The majority of European workers still spend all or almost all of their working time at company premises: only 50% work at their place of work all of the time and 21% never work at their workplace; 9% of workers always work in locations that are outside home and company premises, while 60% never do. Some 1% of workers always work at home with a PC, while 84% never do, and 2% always work at home without a PC, while 79% never do.

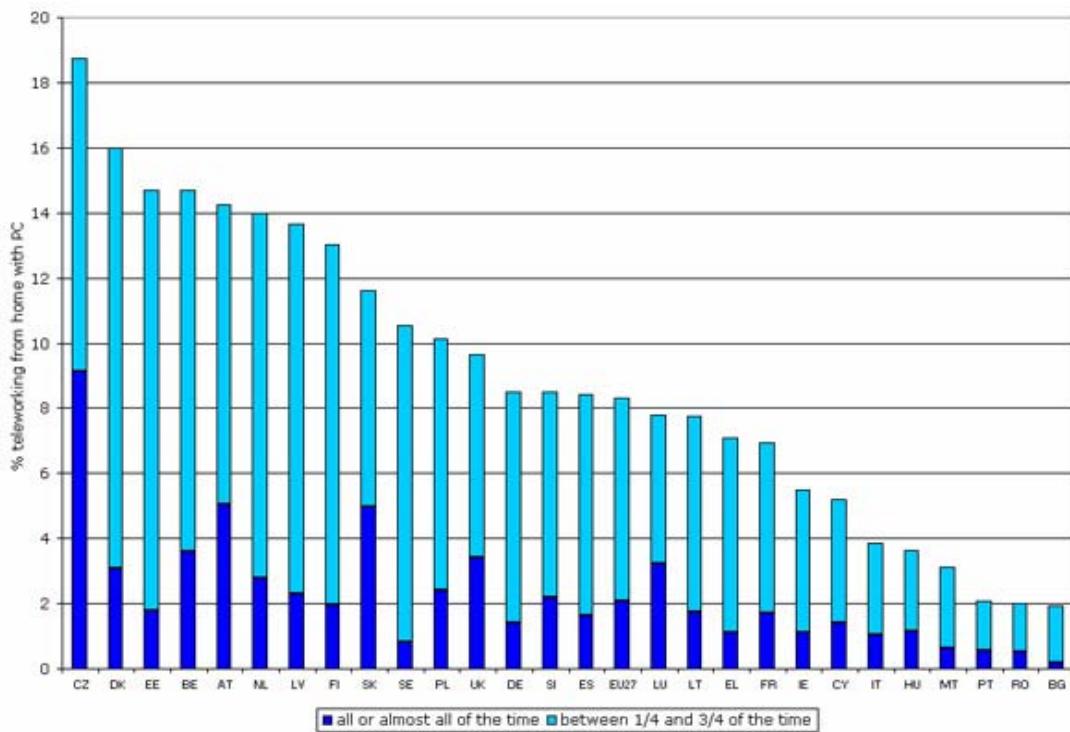
Working locations neither on company premises nor at home, i.e. what may be called “mobile work”, are reasonably wide-spread as well (see figure 5). While around 15% of the EU27 workforce report that they spend some working time at home and make use of a PC for doing so (a reasonable definition of telework), the large majority of this share spends only very few hours at home.

**Figure 5: Place of work (including homework and telework) in EU27, 2005
(in % of total employment)**



Source: Eurofound (Parent-Thirion et al., 2007)

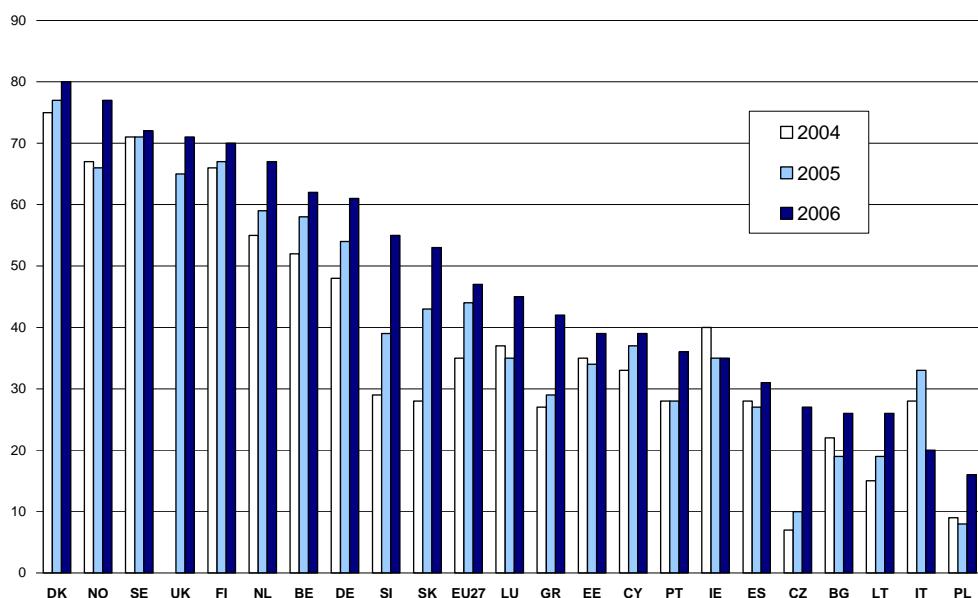
Figure 6 shows country differences in the spread of teleworking at home. The columns only include workers who spend all or almost all (dark blue) or at least one quarter (light blue) of their working time at home. On average, somewhat more than 8 percent of the EU27 workforce met this criterion in 2005, when the EWCS data was collected.

Figure 6: Spread of home-based telework in 2005

Source: Eurofound (Parent-Thirion et al., 2007)

Trends in the spread of telework have most recently been reported again by the **European Foundation for the Improvement of Living and Working Conditions** (2007: 9-10), based on national level data collected by a variable (more or less reliable) sources. In their conclusion the authors also highlight that the incidence of working away from the place of work and of teleworking is increasing and that, in percentage terms, workers are more likely to work away from the workplace than they are to telework.

Different figures were produced by the **Community Survey on ICT Usage in Households and by Individuals**. The indicator used measures the percentage of persons employed who work part of their time away from enterprise premises and access their employer's IT system from there. As Figure 7 shows, using this definition (without a lower threshold for the time spent away from company premises), almost one of two workers in the EU falls into this category.

Figure 7: Spread of remote e-working, 2004-2006 (in % of total employment)

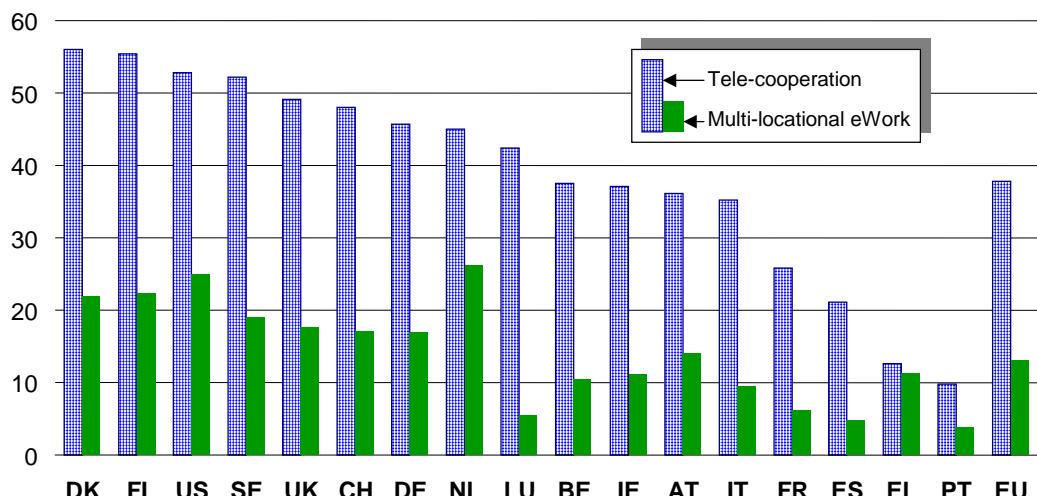
Source: Eurostat database [accessed 2009-03-02, 16:00]

While these approaches open up various possibilities for producing statistics on multi-locational, ICT-supported work, it is restricted to remote work in the sense of work taking place “outside the traditional workplace” and remotely from the location of the employer. In contrast, what has been termed tele-cooperation (Gareis & Hüsing 2002) would not (necessarily) be covered by such definitions. Such tele-cooperation is conceptually closely related to telework, which is the reason why it has been dubbed ‘in-situ telework’: Although the majority of white-collar workers today appear to be co-located in central office buildings, in fact they are often working closely together with value chain and project partners at far away locations. Theory suggests that tele-cooperation can boost worker productivity and innovative performance throughout the EU economy by allowing flexible configurations of human capital without actually moving people from one place to the other.

One attempt to collect data on tele-cooperation was undertaken by the **SIBIS** project (Empirica 2002). It was operationalized for survey research as “communicating with external business contacts via e-mail, video-conferencing or electronic data transfer”. For further explanation, external persons were described as “customers, clients, suppliers, other business contacts, but also colleagues working at other locations of the same company”. Figure 8 makes obvious that the share of workers involved in tele-cooperation (as defined above) is much higher than the share of teleworkers. Obviously, tele-mediated work practices are affecting many more people than only those who actually work from a remote place. It has often been observed that ICTs enable work to be brought to the worker (telework) instead of transporting workers to work (commuting). But work inputs and outputs are also increasingly transmitted between traditional workplaces via ICTs. This is a process which involves all parts of the economy and, as the SIBIS data show, affected already more than a third of the EU workforce in 2002.

**Figure 8: Telework and Tele-cooperation in EU15 Countries in 2002
(in % of total employment)**

Multilocational eWork and Tele-cooperation (in %) Base: Total employment



Source: Gareis (2006), based on data from SIBIS 2002/2003

eWork

Research shows that the concept of telework is too limited and outdated for analysing the impact of ICT in the work domain in an appropriate manner. Telework only covers remote work which takes place outside the company, which will (at least in the near future) remain a more exceptional or additional form of work. In contrast, new forms of ICT-supported work organisation, which are taking place in locational and/or multi-location work contexts (Gareis & Hüsing, 2002), have devoted much more attention to phenomena such as tele-cooperation and tele-collaboration, since there is considerable evidence indicating a large majority of European workers to spend most of their working time in traditional places of work.

The concept of eWork has been proposed to better take into account these phenomena and has found increased application for describing a broad range of ICT-supported forms of work organization. Thereby the concept of telework has been classified as a singular and somehow marginal phenomenon in the complex process of transforming work organization in the knowledge based society and economy. The term eWork was introduced to comprise all kinds of ICT-based forms of collaborative work, especially remote work in shared office premises and tele-mediated work forms taking place in traditional work environments (see Graeis et al., 2004). The broadest definition of eWork encompasses "any normal business activity carried out from a remote location by using modern computing and communication technology" (*ibid*). In this understanding, eWork comprises any type of tele-mediated remote work and includes the following types:

- individualised or shared-office-based work (refers only to the physical workplace of the worker, not to the fact that they share an office with the principal or collaborators);
- collaborative work (tele-cooperation, virtual teams) or work which is performed in the context of principal-agent type relationships;
- work interaction which is inter-organisational, i.e. coordinated by the market (such as client/contractor relationships and freelance work) or work interaction which is intra-organisational, i.e. coordinated internally in organisations.

In table 2 the grey cells contain the main types of eWork, while the last row lists some types which are not considered as eWork.

Table 2: Typology of eWork and distinction between definitions of eWork and NWEs

		Coordination mechanism			
		Principal/agent		Collaboration	
		intra-organisational	Inter-organisational	intra-organisational	Inter-organisational
Work environment	Individualised eWork (away from office premises)	Telework in employment relationships	Freelance telework	Work in virtual teams composed of teleworking employees from a single company	Work in virtual teams made up of teleworkers from different companies (or self-employed)
	eWork on shared office premises	eWork at other site of same company (e.g. back offices)	eOutsourcing	Work in virtual teams composed of employees from a single company	Work in virtual teams composed of employees from different companies
	Non-eWork (examples)	Employed agents co-located with principals	Self-employed co-located with clients	Work in co-located teams composed of employees from a single company	Work in co-located teams composed of employees from different companies

Source: based on Huws & O'Regan (2001) and Hanhike & Gareis (2004)

eWork thus also aimed to comprise phenomena such as virtual organisations and eOutsourcing. Furthermore, eWork was to cover not only industrial work or traditional business organisations, but Non-Profit- and Non-Governmental Organisations (NPOs and NGOs), social welfare and service organisations as well. However, there are also some limitations regarding the most recent notion of eWork. For example, the work of individuals is generally not conceptualized as eWork. eWork can be seen closely related to the use of personal computers. Especially when analyzing the impact of ICT outside of white-collar work, the differentiation between ICT usage and ICT non-usage at work becomes problematic and will be discussed in chapter 3.4.

3.3 Working conditions

Collaboration via ICTs, as is the case in traditional home-based telework, appears to have ambivalent impacts on job satisfaction. Workers who spend only a minor share of their working time at home (in the remaining time in co-located settings) tend to benefit from increased job satisfaction²; more permanent home-based eWork tends to have considerable negative effects on individual well-being resulting from social isolation and lack of access to social resources³. Variety of skill, significance of the task, autonomy and feedback – factors which have repeatedly been shown to be of central importance for the effectiveness of virtual collaboration – were found to be related to job satisfaction in a number of studies. This is hardly surprising since these factors contribute to job satisfaction in “real” collaboration as well.

For example, studies conducted by Hempell et al. (2005) and Kraan et al. (2000) on Dutch workers, which were cited in EWCS 2005, indicate that high-skilled computer work is

² A.o. Di Martino (2001), Cullen et al. (2003), Montreuil & Lippel (2003) and Gareis et al. (2006)

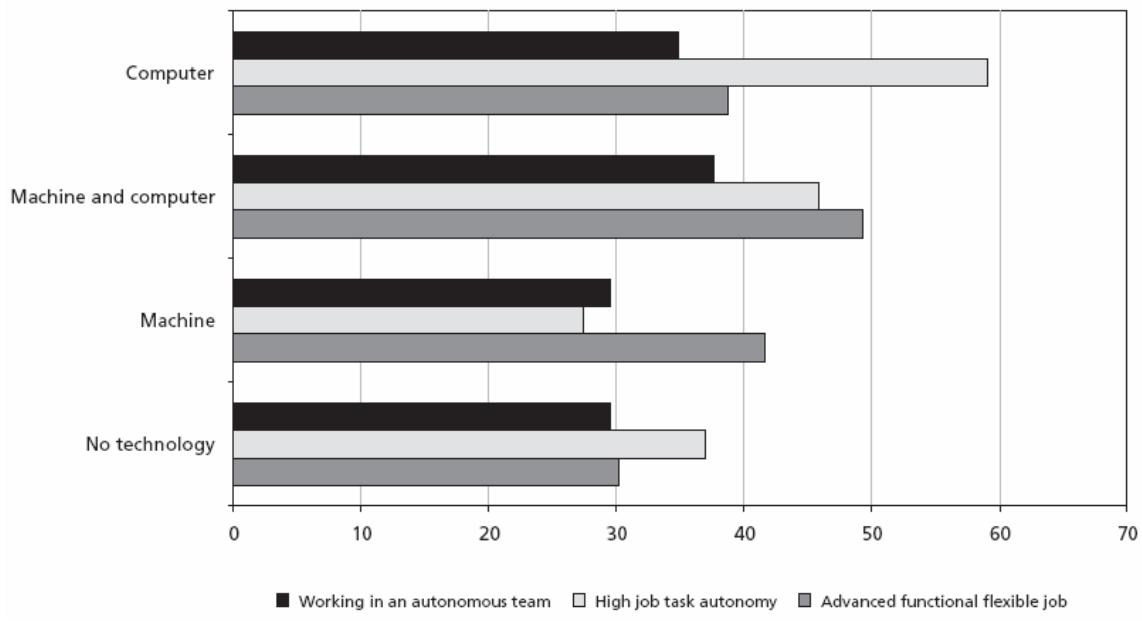
³ A.o. Eichmann et al., (2002), Cullen et al. (2003), Dimitrova (2003) and Treier (2003)

characterised by increased levels of autonomy, decentralisation of decision-making processes and worker participation. Kraan et al. (2000) show that computer work is often associated with greater work autonomy in contrast to non-computer work. It is often assumed that high levels of autonomy at work have positive effects on workers' well-being (Bakker & Demerouti, 2007). With reference to Kyzlinková et al. (2007), the EWCS perceives worker autonomy as an important characteristic for the quality of work.

Kyzlinková et al. (2007) conducted a study for Eurofound on teamwork and high performance organizations. They argue that it is not teamwork as such, but the worker's occupation which affects autonomy. This is to say that a high degree of autonomy only occurs in team work among leading functions, whereas teamwork in other occupational roles is widespread, but not related to increased autonomy.

The EWCS data shows that workers using computers more frequently work in autonomous teams than workers using other technologies and that they have a high level of autonomy regarding job tasks (see Figure 9).

Figure 9: Prevalence of autonomous teams, high job task autonomy and advanced functional flexible jobs, by use of technology, EU27 (%)



Source: EWCS 2005

Research by Dimitrova (2003) suggests that job autonomy almost never increases as a result of remote supervision, as in this case direct forms of control are replaced by more formalised interaction between superiors and remote workers. However, remote management appears to benefit high-qualified workers in advanced job positions, while low-skilled workers carrying out, for example, clerical work, suffer from more formalised forms of control. Dimitrova concludes that eWork "reproduced pre-existing social relations and inequalities" (ibid., p. 191).

Research by Treier (2003) found the level of perceived stress to be greater for teleworkers who have a lot of task discretion, which may be explained by stronger difficulties to "switch off" after the end of the working day. Montreuil & Lippel (2003) and Richter et al. (2006) also found that more enriched working tasks and work in virtual teams subjectively yield more stress.

A key topic in the discussion of individualised forms of virtual collaboration is their impact on the balance between work and family commitments. Antila (2005) argues, relying on data

from a representative survey of Finnish workers, that ICTs, in combination with new management practices, have enabled work to “slop over” into leisure time, to the possible detriment of the interests of the family. The question is whether this blurring of boundaries (which challenges the traditional “clear line” between work and private life) is perceived negatively by the individuals concerned. Antila’s (2005) research showed that the large majority of knowledge workers who use ICTs (including mobile phones) to stay connected to their work during their leisure time do not mind. One explanation is that they realise the benefits they gain in exchange from the increasing flexibility in managing work and leisure time schedules. Cooper et al. (2002) find that knowledge workers use ICTs to extend their working hours, in particular by using spare time during commuting for work-related tasks, but this is not necessarily considered a problem by those concerned.

Richter et al. (2006) conducted two studies of virtual teams and comparable reference groups co-operating in traditional ways. They found that virtual teams “have more enriched job characteristics: In virtual teams more organisational tasks and functions are transferred to members; group work was, to a greater extent, organised by the group itself, members faced significantly more learning demands and responsibilities and were more involved in planning processes” (*ibid.*, p. 238). On the other hand, stronger symptoms of job-related stress were observed in virtual teams, which led the researchers to suggest that the relationship between job demands and stress (under conditions of high job autonomy) is curvilinear.

Most investigations of individualised virtual collaboration find longer working hours as a result of working remotely (Cullen et al., 2003)⁴. However, it remains unclear whether this is a result of eWorking itself or whether it can be explained by the criteria which determine the selection (or self-selection) of candidates for remote working (see Peters et al., 2004).

In their study on the psycho-physiological effects of individualised eWork Lundberg & Lindfors (2002, p. 363) found that remote workers are often unable to “shut off the stress response after the end of the work day” and that this “contributes to the wear and tear of the body.” They conclude that “lack of time for rest and recovery from work could be an even more important health risk in modern society than the actual level of stress during work”.

Mann & Holdsworth (2003) studied two groups of journalists, of which one was working from home. They found out that teleworkers suffered from more negative emotions and that they had higher levels of emotional ill-health than office workers carrying out the same job. Meanwhile, physical health scores did not differ significantly between both groups. Importantly, the study also ascertained more negative results for female than for male eWorkers. This appears plausible given the fact that “the work-family conflict is a source of stress and has been correlated with negative experiences of emotional and physical ill health [...]as] female teleworkers usually retain responsibility for the majority of the domestic chores, which can lead to feelings of frustration, inadequacy and stress” (*ibid.*, p. 207).

Based on data from a comprehensive sample of the Swedish workforce, Johansson (2002) has shown that perceived work-life imbalances correlate with a higher probability of gastrointestinal and cardiac problems and a higher frequency of mood and sleep disturbances and headaches.

The problem of work-life balance also brings up the question of the relationship between job satisfaction and overall life satisfaction. Cullen et al. (2003) did in-depth interviews with fifty persons in flexible working patterns including home-based telework, mobile work and e-lancing. Their research focused on the consequences of flexible, ICT-supported ways of working for family life and for the balance between work and family in general. Their results

⁴ See Dimitrova (2003) for an overview

suggest that high job satisfaction can indeed go in hand with risks to family life and, as a consequence, stagnant or even deteriorating life satisfaction, at least in the long term.

Virtual collaboration is essentially based on computer work. Hence, research concerning ICT-based workplaces and their effects on worker satisfaction and health are of relevance.

Most research suggests that ICTs are positively correlated with work quality. A 2001 communication from the European Commission states, based on data from Eurobarometer surveys and the ECHP, that “new technology appears to have contributed to making jobs intrinsically more interesting and satisfying with greater autonomy, and there is some evidence that women are beginning to achieve better access to more highly qualified jobs with, for example, similar levels of participation in appropriate training” (CEC, 2001, p. 10).

One has to keep in mind that the implementation of ICTs was fastest in innovative, successful enterprises. Furthermore, in the long run computer work involves risks as well. A staff working paper of the Commission (CEC, 2002a), therefore, lists a number of risk factors related to computer work in general:

- stress symptoms due to excessive working hours, workload and increasing complexity of tasks;
- negative side-effects in the form of information overload through email, difficulty in distinguishing significant and insignificant information, and being accessible all the time;
- stress of having to constantly upgrade skills;
- decrease in personal relationships; replaced by virtual contacts;
- physical impairments such as repetitive strain injuries and musculoskeletal illnesses due to inadequate or ergonomically insufficient equipment or due to forced postures, and the combined effects of both.

Research by Dhondt et al. (2002), which used data from the European Survey on Working Conditions (representative sample of EU15 working population), showed that:

- use of computers at work is negatively associated with musculoskeletal health problems and allergies/asthma, while the opposite is true for workers using machine technology;
- use of computers at work is positively correlated with skill development opportunities;
- use of computers at work is also positively correlated to satisfaction with working conditions.

Work intensification

Zijlstra (2007), when investigating into work intensification and its relation to ICT, comes to the conclusion that rather the occupation than the use of technology has a decisive impact in this respect, workers of low occupational levels experience increasing monotonous and routine work, those of high occupational levels do not. This seems to be a consequence of the latter's involvement in the decision-making on the implementation of technology. In this regard, the participation of workers in technology development might be an important measure for job enrichment.

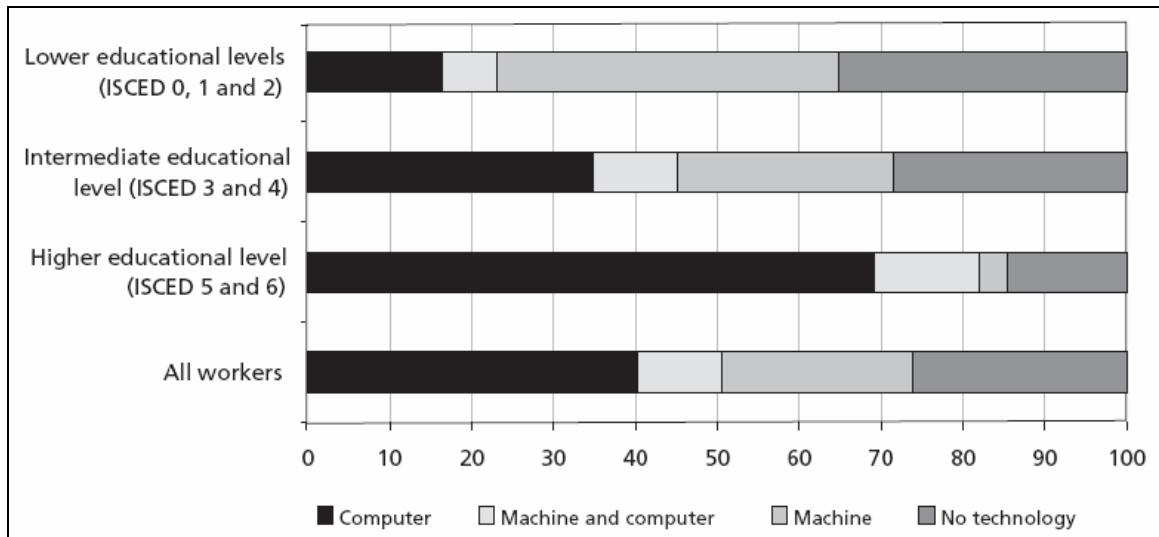
Work intensity is a critical topic, as it is strongly related to health problems. Based on 2005 EWCS data, Houtman et al. (2006) identified the association of computer work with high psychological workload. Repetitive strain injuries (RSI) are affected by intensive (more than six hours a day) computer use. Among office workers, for example, correlations can be found between the duration of computer-mouse use and reported hands or arms problems.

ICT-related skills and qualifications

Based on empirical evidence from the EWCS and Eurobarometer, both the European Commission (2003b) and the Eurofound (2005) observe that investments in ICT are not always supported by investments in company reorganisation and in staff retraining. Data from a 2002 Eurobarometer clearly shows that gains in quality and effectiveness, as perceived by workers, are significantly higher if combined with appropriate training: "Only about half of the workers at workplaces where ICT have been introduced (i.e. about a fourth of all EU workers) indicate that significant complementary changes have been made in their organisations, with still a lower proportion in smaller companies. Even fewer persons say that they had been consulted and/or had received training on new roles and tasks, missing important conditions for managing successful change".

This appears to be of high importance because the data also confirms basic assumptions of work organisation theory: workers that benefit from complementary measures, particularly an organisational change at the workplace, perceive the introduction of ICT much more satisfactorily, in terms of higher job quality. In this context Zijlstra (2007) also argues that insufficient mastery of ICTs at work could lead to "feelings of incompetence" and hence affect workers well-being.

Figure 10: Use of technology at work, by educational level, EU27



Source: EWCS (2005)

Some other, more or less recent studies, which have been cited in the EWCS 2005, show that there is a link between computer use at work and workers' acquisition of skills (see for e.g. Green et al., 2003). Another important survey points at the upskilling effects of computer use at work is "Working with Technology Survey III" held by the Canadian Policy Research Networks (CPRN) (see McMullen, 1996) which mapped data since 1985. In their conclusion the authors of the study state that as a consequence of computer-based technologies, a widespread process of job upskilling is taking place in Canada, through both an occupational shift to higher skill jobs and an increase in skills requirements across most occupations. Kraan et al. (2000) showed in their study on Dutch workers that in most cases the introduction of ICT was associated with greater learning opportunities. But the impact of ICT on learning opportunities depends much more on occupational types than on the technology it self.

Part time-work

In EU27, part-time work is treated according to different arrangements: job sharing, for example, is based on two persons doing the same work, job splitting upon a differentiation of tasks. Part-time work can allow for flexibility of working times on a daily, weekly or yearly basis. Part-time work has become increasingly important during the last years, and in 2008 it contributed to some 18% of the EU27 workforce.

Part-time work is wide-spread as a means to combine work, family and further education. Women are more often working as part-timers than men. Part-time work has continuously increased over the last twenty years. In spite of concerns about ICTs supporting part-time work to the disadvantage of full-time jobs, there is little evidence on such causal relations between ICT use and part-time work in general, and social security, in particular.

It is still not clear to what extent the emergence of new flexible working arrangements is linked to the uptake of ICT. Moreover, besides the question of whether the transformation of work is induced by ICT, there is not much evidence about the extent to which flexible work arrangements, have impacted on the working and living conditions and on workers' social security (for instance on precarious employment).

3.4 Invisibility of ICTs

As the data presented show, the concept of eWork allows for the addressing of new phenomena in the work domain. However, there are also limitations. For example, the work of individuals is not conceptualized as eWork, if they do not use the computer as a communication medium. The same goes for collocated individuals: as team formation requires a form of institutionalization, their spontaneous informal collaboration is also not seen as eWork, if the computer is not the communication medium, as their interaction has neither to be virtual team work nor tele-cooperation. However, ICTs may, for instance, control production tools, and people may spontaneously collaborate with each other by means of these tools. In spite of its high importance, for instance of blue collar work, it is not covered by the concept of eWork.

The concept of eWork focuses on ICTs as an enabler of new desktop-based working and collaboration forms, ignoring forms of work which are affected by ICTs in another way, for example, by being changed, improved or even replaced by ICTs. For example, single-user ICTs have been integrated into existing tools without being necessarily related to telework or tele-cooperation. Such digitalization often was intended to widen the range of possible tool usages and, therefore, could contribute to job enrichment and job satisfaction. On the other hand, the new, more powerful tools demanded for new skills and knowledge.

An early example at stake was the introduction of CNC machines which formed a major challenge for the older mechanical lathe operators. Similar changes occurred, for instance, in design, where CAD replaced the old drawing board, or in media production, where desktop publishing replaced older photocomposition techniques. In offices, labour became similarly mediated by computers, too. This type of ICT-implementation did not necessarily have less impact on work than the emergence of tele- or eWork.

Even when tools were not primarily designed to change collaboration, but individual work, they could induce changes in collaboration as second-order effects, and these second-order effects could turn out to be more important than the anticipated effects for the individual user. For instance, the implementation of GPS may be only a new form of navigation, but one that may affect the whole distribution of roles on a ship. Related to the implementation of ICTs, it would not be covered under the concept of eWork, although ICT plays a major role. The share and impact of these types of applications may be large, but it is difficult to determine it empirically, as a part of such work-supporting applications partly remains invisible: related ICTs are embedded within other tools.

Sometimes being invisible was the explicit design rational, for instance, in *ubiquitous computing*, which has been aiming at weaving ICTs so intensely “*into the fabric of everyday life until they are indistinguishable from it*” (Weiser, 1999). ICTs should become integrated into everyday artefacts instead of remaining dependent of computers, which should become “disappearing”. In related visions, “ambient intelligence” is expected to enhance the functionality of existing artefacts, among them furniture (“*roomware*”) or clothes (“*wearables*”).

When ICTs have implemented computing into everyday and work tools, and have become parts of televisions, telephones, cars, heaters, tractors, taxi radio, forklifts, etc., this could often be no more than a digitalization of existing analogous control technology. However, *pervasive computing* now enlarges the reach of control technology and invades new fields by means of sensor and, for example, radio frequency-identification technology (*RFID*), (BSI et al., 2004). Such systems can replace work by automation, but also establish additional applications that may support well-being. Due to this ambivalence, the spread of related technology is a highly interesting research issue, but not covered in enough detail by statistical research on eWork. Here case studies play an enormous role and should be used to inform statistical research about important technological and social phenomena and emerging opportunities to study them.

Studies collecting related experiences help to identify general issues, such as the problem that identification may not only be used for logistics, for example within supply chain management, but could also be used to identify individuals indirectly, or even directly (ULD et al., 2006). The European Commission has taken up the *RFID* issue and adopted related recommendations to secure privacy (EC, 2009). However, there are a lot of technologies in which ICTs may even become invisible, some of which are highly important, as they have a particular potential in supporting persons without much ICT affinity. Therefore, methods which make important impacts of invisible ICTs visible (for instance, case studies) are important contributions on social-impacts research.

Another field at stake is the new branch, in which software is not a means of work, but its product. Related work can also be affected directly by technological changes even when those were not meant to affect it. For example, increased bandwidth may allow downloading of video files, which in turn may endanger the stability regional teleshop applications. Or a greater share of Java applications may endanger the competence portfolio of software companies developing in a programming language like “C”. Interesting enough, most enterprises in the European ICT branch are very small, and a lot of the work is done in collocated agile development forms – which again would not necessarily fall under the concept of eWork, although their work is highly related to ICTs.

This is not to deny the weight and relevance of eWork-related research, which has been described above. The remarks here are to point at the necessity to develop research methodologies further, which is, or course, work in progress. As a lot of technical assessment studies converge in the argument that social impacts should not only be taken into account after technological change, but also during technological change (see Ropohl, 1991), it is good that Europe has much experience with related R&D. Although still only to a certain degree and under experimental conditions, *Living Labs* allow for more situated studies upon technology studies. However, this is only a more recent example of responsive R&D, which should be developed further (see, e.g., chapter 5)

For example, when technology was described as a “socio-technical system”, it turned out that aside from development, the appropriation and use of technology may be important. Related pioneering work of the Tavistock institute in London on Participatory Design (see for instance Emery, 1993) was enriched by studies, which placed the use of applications into socio-historically influences activities (for example Engestrom, 1999). The function of a technology, therefore, had to be embedded within a given socio-historical situation. In fields such as computer-supported cooperative work (CSCW) and learning (CSCL) and End-User Development, ongoing research became a fundamental part of development work.

Conceptions of the Information Society have often been based on constructed visions and future scenarios. In contrast, work research generally uses established role differentiations. For example, the notion of the “knowledge worker”, which guided many studies of the *information society*, often is used as an *ideal type*. Interpreting it as an empirical concept would demand to define an antonym (such as an “ignorance worker”). Instead it is assumed that blue-collar work will be replaced by white-collar work. As we already pointed out, the share of knowledge work in society has risen. Nevertheless, the Industrial Revolution did not end agriculture, “only” reduced its share, working conditions and production methods. And there is a lot of evidence that making the ideal type of an information society decisive in economic policy will affect, but not replace industry.

If technology development is to be studied neither in a deterministic, mono-causal, nor thoroughly top-down manner, conceptions that help to find an access to the field have to be ongoingly re-adjusted or widened. For example, a loss of employment can be the result of an ICT-based restructuration of production. Even such job loss must not necessarily lead to social exclusion. However, the related problems should not be ignored and social exclusion not be reduced to e-exclusion. A related danger arises in discussions on the impacts of ICTs when we do not take into account invisible uses of ICTs, as well.

Technology may contribute to automation or creativity – in both cases often different from the way it is expected to contribute. Therefore, a R&D culture which is sensitive and proactive finding related experiences about specific applications should be further supported and developed, and used as a valuable access into recent developments of the work domain.

4 Social Impacts analyses

4.1 Rationalization

Expectations about labour productivity to increase significantly as a consequence of the implementation of ICT were a major motivation for its introduction in the work domain. However, it turned out that the expected productivity effects, in particular on the macro-level, were not as easily gained as expected. A discussion emerged on a “productivity paradox”, often related to works of Eric Brynjolfsson - even if he was not the first one to use this phrase and later (Brynjolfsson & Hitt, 1998 and Brynjolfsson & Yang, 1999) attributed a considerable potential to increase productivity to ICT use - under the condition that the implementation of ICT is combined with organizational innovation.

Increased productivity is a potential economic impact of technology, but it may have social effects and causes. Therefore, we do not dwell much on the complex discourse on the nature of the “productivity paradox”, but rather concentrate upon the relationship between the use of certain ICTs and the applied organizational development, which is obviously a core point for improved productivity of work when implementing ICTs. The connection between the two can be influenced by organizational (and educational) measures in the field and by the organization of technology development and implementation as well.

EBusiness Watch (EC, 2008) states: “An analysis based on EU KLEMS panel data from 1995 until 2004 finds only a modest impact of ICT capital on labour productivity. Instead, the key driver for labour productivity growth (measured as gross production value per working hours) was intermediate inputs intensity. This indicates that outsourcing has been the key to increasing labour productivity. The strongest evidence in this respect was found for the retailing, chemical and steel sectors, and to a lesser extent for transport and banking.”

The fact that outsourcing was found to be a key strategy to increase productivity shows that ICTs are often easier to be used for differentiating production or service processes than as a business enabler for new services or products, although the major benefits of ICTs in the

business world are often seen in their ability to enable new value chains. This is to say that taking full advantage of ICTs depends not only on the technology at stake, but also on the form of its implementation and appropriation (this is in line with our non-determinist stand regarding technological change).

As we showed before, technological innovation was often seen related to large-scale hi-tech systems which, by their very nature, were to integrate assets of the organizations that adopt them. However, it turned out that the benefits from integrating data were limited by the importance and relevance of the data at stake for the respective contexts. For example, Knowledge Management turned out to be a question not exclusive to big central data bases plus technical access infrastructures: instead, users had to become interested in participating, knowledge had to be made understandable and exchangeable, and the initial hurdles to integrate related systems and maintain them had to be taken into account (Huysman & Wit, 2002).

Expectations thus often turned out to be unrealistic, as the functioning of the technology needed to address the given situation and well-identified assets, whereas, in fact, in initial phases, technology was often only based upon some generic ideas from the ICT producers. Therefore, studying the impact of ICT should not treat ICTs only in terms of their efficiency for supporting features the artefact was designed to support. Instead it needs to be taken into account how the addressed potential for improvement that led development was conceptualized and whether this was appropriate for the given situation. This is to say that, although technology matters, its impact may be different from the expected outcome not only in scale, but also regarding nature.

The situation in Europe (and beyond) after the time of the large mainframe systems regarding ICT adoption has been described as following three phases (see EC, 2008): in the first phase, ICT was seen as being *per se* economically positive to the extent that ICT products were bought by customers without detailed experiences with the applications. The related boom of the Nineties experienced a sharp crisis during the “crash of the ICT-bubble” around the millennium change, which brought an inversion of the situation: ICTs were regarded to incorporate costs without benefits. If ICTs were bought before without considering the concrete application at stake, the same now was true in an inverse manner. The market for ICTs nearly collapsed, and it became hard for the mostly small firms of the ICT branch to survive in the market. The third phase then was related to an upcoming detection of business advantages which can be exploited by ICT implementation.

This history shows that rationalization, in particular when related to innovative measures, must not be seen as a linear progressing on a pre-given, fully transparent path, but instead as an anticipation of future situations which have to be imagined under conditions of incomplete, cost-intensive, often conflicting and only partly accessible information. Thus rationalization was a driving force for the implementation of ICT, but this did not guarantee that the impact of the implementation of ICT was always increased productivity, either based on cost-saving or on product innovation. In spite of the great potential of ICTs to enable innovative value, many implementation strategies were only oriented towards saving costs. And still, both strategies could fail. It obviously demands experience and long-term strategies to identify assets of a company and potential benefits that can be derived from the support by technologies.

When studying the appropriation of ICTs, a study by Michelle Gant and Bonnie Nardi (1992) revealed as early as 1992 that ICT-related roles may emerge when people working with ICT collaborate: individuals who know about a given working situation and have some ICT knowledge may play an important role as “IT-gardeners” to keep ICT supportive for the organization. These individuals must not necessarily formally be in charge of ICT implementation or maintenance.

To identify and motivate such people could not only be beneficial to support technological self-organization, but could even be its prerequisite: in particular, in areas and regions where ICTs are not yet common, such efforts could be first steps. But this demands for more participatory approaches and less “technological-fix” thinking. The same can be said to the identification of “killer applications” or, at least suites of “pick and mix’ of applications” (Harkin, 2005).

When discussing rationalization in the work domain, enterprise strategies aiming at an externalization of internal costs should not be forgotten. One strategy is to let the customer work him-/herself for a product or service (cf. Voß & Rieder, 2005). For instance, today it is the client who prints the ticket or the account statement. Sometimes such blurring of roles, for instance, as presumption, makes life easier and more flexible for the client, but it can also make it more complicated and demanding. Related further empirical research is needed. To a certain extent, the customer is decisive if his only interest is cheap prizes, but there are also cases where the customer has no influence, for instance, if ticket offices are closed and replaced by digital ticket machines. One related problem is that there needs to be a sort of sense for quality in the public sphere, if quality-orientation of producers or servicers is to pay off. Here a trusted third, maybe an intermediary, can be of importance.

A more problematic externalization of costs sometimes takes place when enterprises, instead of adopting qualification methods, count on early retirement schemes or other methods to replace older staff with younger workers who have more up-to-date ICT knowledge. Early and ongoing qualification measures are one means to avoid the described forms of “rationalization”, as enterprises hesitate to dismiss individuals in whom they invested time and or salary. In this context, the EU adopted important steps. However, there are other domain reports which elaborate on this issue.

As mentioned before, there is no causality between eWork and job autonomy. This is to say that there is job enrichment for quite a share of the work force using ICT, but also precarious employment for another. Bain et al. (2002) (see also Taylor et al., 2002) speak about neo-Taylorist working conditions as a consequence of the use of software programs to easily control distributed call-centre work (which may be home-based). Gareis et al. (2007), when discussing call-centre work, also describe “those in jobs of decreasing quality, often in neo-Taylorist work settings, fully exposed to competition by low-cost labour from abroad, and with problematic consequences for human capital development, job satisfaction, and health.”

We mentioned above the concept of the knowledge work, which helped to identify new phenomena. However, even if knowledge can be seen as a resource, this does not determine how it is exploited. From a socio-economical perspective, the case of call-centre work is interesting as it often cuts business off from non-standardized customer feed-back, which is seen as a major source for information (von Hippel, 2005). Of course, there are certain opportunities to use call-centre work for collecting customer feedback. However, this demands for less restrictive and control-oriented call-centre software, better education for call-centre workers, and inter-organizational arrangements which support knowledge exchange. This is in conflict with strategies that only focus on cost reduction. Once again qualification is a crucial issue for the future development in ICT based services.

We can conclude that in the mean time, ICT has been adopted in nearly all sectors and regions of the European work domain. It is often seen as a challenge, when work may become more integrated into decision making processes and there is job enrichment. However, not every knowledge worker is per se well off. Precarious working conditions may be incorporated into control-oriented ICTs. In spite of the related importance of ICTs, these may be invisible, for example, when being embedded in larger systems.

E-exclusion, therefore, does not only exist within access and usage, but may already be present in the development of ICTs. Those who are involved in the design of their working environment seem to have better chances to be supported by it. To allow for specificity and

general technical solutions, at the same time, adaptive or adaptable systems have been developed, which allow for the tailoring of the systems according to the situation given. However, the appropriation of innovative technology remains a problem for the organizations involved.

Rationalization, in this context, is a driving force, but not a determined one. Rather, it depends on the appropriate interpretation: if it is interpreted in a short-term manner, in which cutting costs *ceteris paribus* is the major advantage, or if it is seen in a long-term perspective as a contribution to better services and products. In this regard, it is not only the work domain, which is decisive, but also, for instance, consumer habits.

4.2 Networking & Social Capital

Networking has become so important in modern society that, for example, van Dijk (1991) and Castells (2000) speak about a “network society”. Of course, networking has not been without effects upon the work domain. On the one hand, for many employees, there has been an increase in networking activities within daily work and a blurring of boundaries between development, production, services and consumption, this is: a change in the customer relations. As related trends of networking combines production and consumption in a new important way: the related effects, for example, the emergence of the “prosumer”, are described in detail in the domain report on consumption.

Related strategies to establish “complex products” by means of adding value (for example, additional services for buyers of a product) can be supported by heterogeneous networks of different actors, which thus can constitute and become constituted by new forms of interactive innovation creation and diffusion. This is addressed by the concept of Open Innovation (von Hippel, 2005). For many employees, related developments imply additional demands on qualifications (see the chapter on life-long learning).

A new phenomenon of networks in the work domain is the “Virtual Organization” or “Virtual Team”⁵. These virtual organizational structures can be defined by

- “absence of traditional organization structures and principals which imply a formal definition of internal order,
- Trans-boundary amalgamation of organizations or enterprises;
- temporal instability of the virtual unit which affiliates, changes fluidly, expands or reduces itself, and disappears after achieving its purpose;
- non-simultaneity of collaborative processes and acceleration of organizational development;
- spatial distribution, and
- modern ICT as a precondition for the existence of the (virtual) organization” (Rohde et al., 2001, p. 3; cf. Mambrey et al., 2003).

Virtual organizations exist of networks and communities where the members are spatially distributed and mainly collaborate with one another online. The technical support for (asynchronous and synchronous) communication and collaboration in this kind of organization influences institutional character, stability/dynamics, and patterns of interactions of organizations and social systems. Virtual organizations usually transcend organizational borders and include members of different organizations and networks.

⁵ Cf. Davidow & Malone, 1993; Nohira & Berkley, 1994; Strausak, 1998; Travica, 1997

In spite of the role ICT plays for Virtual Organizations have different forms in organizational terms, many of which are older than ICT. However, these forms can be open and overlapping. Some resemble of a cooperative, others more of an agency that contracts networks of freelancers (if this happens only in case of orders, this may (not necessarily) lead to precarious occupation in case of missing orders). Like in related arrangements before the use of ICTs, one major point for the individual is, if such arrangements are voluntarily chosen forms of work or if the individuals at stake have no alternative. Aside from the market situation in a wide sense, this is mainly a question of qualification and life-long learning.

In regard to new qualification demands, (often ICT-supported) networked forms or organizations such as communities or networks of practice (CoPs and NoPs) play an important role for exchanging related knowledge. This means that networking requires related qualification, but it can also contribute to related learning. These effects will be discussed in the following sections of this chapter, in which deal with the notion of *social capital* and ICT.

In recent years the vast success of Web 2.0 applications and the open source software (OSS) projects shows the potentials of ICT-based economies. They are based on the establishment of online-communities whose members significantly contribute to the design and the development of these software systems. In this context, issues of communities and technologies, social capital and trust-building gained prominence in socio-informatics and community computing.

Especially in the field of CSCW research (Computer Supported Cooperative Work), online-communities and their socio-technical preconditions have been investigated thoroughly. Social capital in the sense of sustained mutual relationships is a precondition to enable expertise sharing among human actors⁶. The success of Web2.0 applications and the OSS Movement is based primarily on online communities in which users add their competencies, expertise and personal engagement to the collective efforts to produce software and content. Socio-cultural theories of learning hold common practice and mutually defined identities to be central enabling conditions for expertise sharing (Brown & Duguid, 1991; Lave & Wenger, 1991; Wenger, 1998).

Stemming from sociology and political sciences, the Social-Capital approach does not primarily focus on (socio-) cognitive processes like learning and identification, which refer to socio-constructivist or socio-cultural theories. Despite the broad variety of definitions of the concept of Social Capital, there are many analogies between the set of Social Capital approaches: Bourdieu (1983) – as the scientific adaptor of the concept - has distinguished three forms of capital (economic capital, cultural capital and social capital) in order to understand individual behaviour in socio-historical contexts. Later the concept was used to measure intellectual capital, suggesting that social capital should be considered in terms of three clusters: structural, relational and cognitive. The relational dimension focuses on the character of the connection between individuals. This is best characterized through trust of others and their cooperation, the social identification within a network, and the communication which is needed to access and use social capital through an exchange of information. Since meaningful communication requires at least some sharing context between the interacting individuals, Fukuyama (1995, 2000) defines Social Capital as the existence of a specific set of informal values or norms shared among members of a group.

For the establishment of social groups, especially the building of communities and social networks, both within and between organizations, the building of trust is one of the most important issues. Even for traditional organizations, relationships of trust often get more important than formal structures (e.g., formal division of labour, hierarchies). Social Capital is

⁶ Cf. Ackerman et al., 2003; Huysman & Wulf, 2004; Huysman & Wulf, 2005; Cohen & Prusak, 2001

defined by Robert Putnam as the sum of networks and social contacts, the trust (respectively trustworthiness), and reciprocity relations a person owns. Putnam highlighted the importance of voluntary associations and organizations for the creation of social capital and comes to the remarkable conclusion that "social capital makes democracy work" (Putnam 1993, cf. Putnam, 2000). Nevertheless, Putnam's definition focuses predominantly on an individual perspective of social capital. This leads to the critical objection that Putnam's approach is concentrated too much on personal contacts, face-to-face networks, and very near located neighbourhood relationships.

To deal with the Social Capital of collective actors (like communities or organizations) and of more distributed networking processes, the concept has to refer to the network contacts, the generalized trust, and the norms of reciprocity the collective subject has established. To adapt the concept for collaboration processes in companies, Cohen and Prusak conclude: "Social Capital consists of the stock of active connections among people: the trust, mutual understanding, and shared values and behaviour that bind the members of human networks and communities and make cooperative action possible. (...) Its characteristic elements and indicators include high levels of trust, robust personal networks and vibrant communities, shared understandings, and a sense of equitable participation in a joint enterprise - all things that draw individuals together into a group" (Cohen & Prusak, 2001, p. 4). The authors refer to the concept of social capital mainly to analyze and support information and knowledge management within companies, departments, and working groups.

Concerning processes of gaining and fostering social capital, the approach assumes that it accumulates when it is used (productively), otherwise it decreases. In this sense social capital tends to be self-reinforcing and cumulative. People gain connections and trust by successful cooperation, and these achievements of networks and trust support good cooperation in the future. To gain and foster social capital, Cohen and Prusak suggest the following (organizational) investments in trust-building processes.

Other than traditional organizations, in which issues of trust are institutionalized by a fixed set of norms and organizational rules, formal hierarchical structures and well-defined processes, inter-organizational collaborations and more virtual organizational structures rely heavily on informal aspects like trust and social capital. Modern ICTs have supported some reformation of traditional work organization. Two of these new work organizations can be found in emerging inter-organizational cooperation in regional (industrial) clusters and in mostly informally organized Communities of Practice (COP).

ICT diffusion processes and developing work organization structures are marked by little homogeneity: the increasing standardization of ICT features should not erroneously lead to the conclusion that related processes guarantee a very structured, well-known development path. Instead the relevant features and perspectives of the multi-facetted and far-scattered ICT diffusion remain to be identified case-by-case, with generalizations to be developed only afterwards. Thus case studies must become a basis for a more comprehensive understanding of ICT and more detailed surveys. In particular, they allow for comparisons and the formation of *ideal types*. However, there is still little systematization of investigations into the field by means of case studies.

In the US, case studies of regional industrial clusters attracted considerable scientific attention recently. However, the discussion has not yet led to a coherent definition of the concept and a sufficient understanding of the mechanisms of a cluster's emergence and reproduction (cf. Lundvall, 1992 and Giuliani, 2005). Porter (2000) has defined regional industrial clusters as a "geographical concentration of interconnected companies, specialized suppliers, firms in related industries, and associated institutions (...) in particular fields that compete but also cooperate" (p. 15). One can define regional networks as those socio-territorial entities which consist of regional firms working in a similar industry but do not qualify as clusters due to a lower level of concentration or lacking vertical integration.

From the very beginning of the discussion, scholars have been aware of the importance of knowledge "spillovers" for the flourishing of regional clusters. Marshall (1890) saw the main reason for regional clusters to emerge in the physical domain. However, he was already aware of the fact that expertise sharing within a specific industry can be enabled by physical proximity of the actors. Right now economies in the industrialized world are moving from mass production towards flexible specialization as well as from material products towards knowledge-intense services. Under these conditions regional learning in the sense of information-passing and expertise-sharing becomes an increasingly more important economic factor (cf. Florida, 1995). This fact is also reflected in the cluster-related literature (cf. Porter, 1990 and Saxenian, 1994). Other studies have supplemented this view by pointing to the importance of cultural factors such as shared values systems and a feeling of reciprocity among regional actors (cf. Becattini, 1990 and Lazerson, 1990). Giuliani (2005) explains the development paths of regional clusters primarily from a knowledge perspective. She argues that the ability of the individual firms to absorb information or expertise from external sources is central to the growth potential of regional clusters. Universities are often seen as important institutional factors in technology-transfer and the development of regional clusters (cf. Saxenian, 1994 and Lockemann, 2004).

Several analyses of industrial innovation underline the importance of (regional) inter-firm networks as the locus of (organizational) learning (e.g. Powell et al., 1996). The studies are focusing on Research & Development (R&D)-activities of biotechnology and life science industries mainly in the US (Powell et al., 2005) which are compared with the European life science industry. R&D-activities are seen as manifestations of innovation and organizational learning, and they are analyzed with respect to inter-organizational partnerships and networks.

The neo-institutional approach identifies different forms and kinds of inter-organizational networks, which show different characteristics with regard to organizational structures, density, range/size, age/growth, etc. This approach on innovation and knowledge networks is focused on institutional/organizational ties instead of social or individual relations. Therefore, it underlines structural characteristics and dynamics of networks more than cultural variables. This neo-institutional perspective, therefore, shows some remarkable shortcomings. With respect to learning and knowledge-building processes which are not mainly directed to organizational learning but to human (personal and social) skills and competencies, individual development and social processes seem to be of higher relevance. Nevertheless, neo-institutional theories can help to understand the inter-organizational processes and dynamics interrelated to the building and establishment of networks.

Besides the mentioned neo-institutional approaches, socio-cultural concepts gained prominence for the investigation into new forms of cooperation and communication in network and community organizations. The Communities of Practice (COP) approach has been developed by Jean Lave and Etienne Wenger (1991) on the basis of socio-cultural theories of learning. Since learning in this theoretical context takes place as a process of enculturation into a practice of a community and since the inclusion into a community is mainly based on collective learning, this approach is a good example of Vygotsky's (1978) socio-constructivist assumption of the "zone of proximal development", which describes the role of social context for learning: More experienced core members of a COP help new members learn and gain "cognitive apprenticeship". The social context in a COP makes collaborations happen and therefore determines learning.

The theoretical approach of COP integrates identity theory, theories of practice and theories of social structure and situated experience (Wenger, 1998). In their research on situated learning in working groups, Jean Lave and Etienne Wenger focus on common daily practice of group members, active membership, and in-group awareness (Lave & Wenger, 1991). The most important inclusion mechanisms concerning these communities are processes of collective learning and the production of shared meaning and collective identity. The concept

of the COP does not comprise organizations or enterprises as a whole, but (mostly informal) working and cooperation units: "These practices are thus the property of a kind of community created over time by the sustained pursuit of a shared enterprise" (Wenger, 1998, p. 45). In this approach, the social practice refers to explicit and tacit knowledge and competencies. It integrates language, tools, documents, symbols, and roles as well as conventions, norms, rules, perceptions, and assumptions.

The development of a common practice defining the community includes the negotiation of meaning among the participating members, mutual engagement in joint enterprises and a shared repertoire of activities, symbols, and artefacts. This community practice is inseparable from issues of (individual and social) identity which is mainly determined by negotiated experience of one's self in terms of participation in a community and the learning process concerning one's membership in a COP (Wenger, 1998, p. 145 ff.). The mechanism of (social) identification of individual persons in the social context of the community plays a key role for the formation of a community of practice.

To distinguish between communities that do not only share a common practice, but actually coordinate this practice in a direct and systematic way on the one hand, and groups with looser links and weaker coordination on the other hand, the concept of "Network of Practice" (NOP) was introduced (Brown & Duguid, 2001; Duguid, 2003). Contrary to COP, NOP can be characterized by fewer coordinative rules and less restricted membership. They are more extensive and can include several COP. "The major distinction between the COP and the NOP turns on the control and coordination of the reproduction of a group and its practice" (Duguid, 2003, p. 12). In comparison with COP, NOP can be looked upon as social aggregations with a higher degree of openness that allows higher dynamics. Furthermore, an advantage of the NOP concept is that it makes sense for larger, more amorphous and looser-tied groups than those that the COP approach would define as a community.

While during the recent years regional industrial clustering was fostered by EU programmes and COP concepts have been integrated in management strategies at a very broad level, it cannot be evaluated in a valid way, how these developments affect individual workers' conditions: division of labour, work place environments, competencies, qualification and learning etc. Despite lacking data for the estimation of social impacts of regional clustering for working life, some effects of COP related management methods on the requirements for qualification and lifelong learning can be named.

4.3 Empowerment and Participation

There is quite a long tradition of European projects focusing on the participation of users in ICT design and introduction processes. These European experiences with the participation of end users are closely connected mainly to two hopeful expectations:

- empowerment of end users and democratization as important factors for the quality of working life, and
- increasing efficiency of ICT related production infrastructures by exploitation of collective efforts.

The important role of end users' participation has been demonstrated recently by the success of Open Source Software (OSS) projects as well as by the rapid advent of the Web 2.0 movement, whose success can be traced back to, among other things, exploiting collective intelligence of participating end users. The 2007 Gartner study (Cearley et al., 2007) on emergent technologies emphasizes the importance of user participation for the establishment of Web 2.0 beyond well-known success stories such as Wikipedia, Youtube or other media sharing platforms:

"The potential of collective intelligence to outperform traditionally managed approaches to production has been proven in a small number of well-known examples in the public domain

(such as open-source software and Wikipedia). Within organizations, challenges include determining where the approach offers superior performance and how to introduce an approach that runs counter to traditional corporate expectations of accountability and financial motivation" (Cearley et al., 2007).

Especially for the engagement of users in social software projects, methods of Participatory Design (PD) have proven to be successful in software and usability engineering. Most prominent Participatory Design projects had their origins in the socio-technical systems approach (STS) of Eric Trist and Fred Emery, who worked at the Tavistock Institute of Human Relations in London. The Tavistock approach of STS focuses on complex organizational work design that recognizes the interaction between people and technology in workplaces (Emery & Trist, 1960).

STS is going back to the Hawthorne Studies and the Human Relations Movement (Mayo, 1933). The Hawthorne Studies, conducted at Western Electric's Hawthorne plant near Chicago (1924 to 1936), aimed at a greater understanding of the effects of working conditions on workers' productivity. The results of the studies brought empirical evidence for the relevance of motivational factors for human work's productivity. These findings led to a paradigm change in management science re-focusing on topics such as social relations, motivation, and employee satisfaction. Human relations theorists were stressing that these human needs and qualities influence work productivity much more than technology, and therefore should be considered regarding organizational development first.

Based on the Human-Relation approach and focusing on the interplay between human work and technological support, Emery and Trist looked upon organizations as an integration of a technical system and a human (social) system. According to their assumptions, it's organizational success cannot be achieved by optimizing either the technical or the social system but to aim at a "joint optimization" of both of them, taking into consideration the social and psychological impact of technology on workers (Emery & Trist, 1969; cf. Mumford, 1987, p. 63). Furthermore, socio-technical systems were seen as "open systems" in the sense that they have to respond highly dynamically to demands of organizations' environment. Thus, the STS approach provided an integrated and quite holistic perspective on organizations as an interwoven system of technological tools, human resources and organizational structures within a complex environment of market, other organizations, politics and society (Ropohl, 1999).

Focusing on a most appropriate design of human work in industrial organizations, STS theorists propagated collaborative structures in autonomous workgroups, in which workers were allowed to spontaneously develop their own work routines, make decisions, and change tasks with little or no supervision (Emery & Trist, 1969).

Since the 1960's, the STS approach has influenced the European discussion on *quality of working life* (cf. Emery & Thorsrud, 1976) and the Scandinavian school of user participation in system development⁷.

First concepts of Participatory Design (PD) have been developed in Norway during the early 1970s. In several Scandinavian projects with trade unions PD was further developed for the improvement of the participation of workers in software development processes and the cooperation between software developers and end-users⁸. One of the central ideas of PD is the insight that good IT systems cannot be built by design experts without close cooperation of potential end-users. To support this dialogue and collaboration between designers/system

⁷ Cf. Nygaard, 1986; Bjerknes & Bratteteig, 1988; Bødker & Grønboek, 1991; Bjerknes & Bratteteig, 1995

⁸ Cf. Bjerknes et al., 1987; Bødker et al., 2005; Ehn, 1993; Greenbaum & Kyng, 1991; Blomberg & Kensing, 1998; Kensing, 2003; Kensing et al., 2003; Mørch & Mehandjiev, 2000; Schuler & Namioka, 1993

developers and end-users, PD researchers developed methods which allow users to participate in IT development projects as experts of their own work processes.

According to Greenbaum & Kyng (1991, p. 4) four issues are central for IT design:

- IT developers have to take work practice seriously.
- They have to deal with human actors (end-users) and not with roles, tasks, functions and structures.
- Work tasks must be seen within their context as situated actions.
- Work is fundamentally social, involving extensive cooperation and communication.

To overcome the barrier between design practice of software developers and the work practice of end-users, PD projects include the users in processes of "design at work" (Greenbaum & Kyng, 1991) or "design in use" (Henderson & Kyng, 1991). PD approaches combine design-by-doing methods, scenarios and different forms of prototyping (such as mock-ups, rapid prototypes), work organization games and ethnographic methods.

The PD discourse inspired new process models of software engineering and led to various approaches of end-users' modifications of IT systems, which have been discussed under different labels. Based on Henderson and Kyng (1991), these development activities of end-users can be subsumed under the label of "tailoring". In a very highly dynamic environment this approach will cause quite some overhead if all adaptations of the software lead to the establishment of a revision with an involvement of system developers. Therefore, evolutionary and participative software development has to be supplemented by activities performed by end-users or local experts of the application environment (cf. Wulf, 1994 and Lieberman et al., 2006).

During the last few years, the Participatory-Design discourse has paid more attention to collaborative, community-oriented design activities and to autonomous, self-organized initiatives by end-users. Contrary to the development of a new system version, tailoring of IT systems means that an existing version of a system is adapted to changing requirements during its use. Thus, during system design, aspects of the functionality which should be tailorabile have to be selected and tools have to be developed that support the adaptation of these features. Contrary to traditional system design, tailoring is always participative as it is initiated by users and almost performed by them. According to this central role of end users and a far-reaching understanding of end-user activities during ICT design and introduction processes, the new paradigm of *End User Development* (EUD) was brought into the discourse on participation.

The main goal of EUD is to empower end-users to develop and adapt systems themselves. Some existing research partially addresses this issue, advocating users as the initiators of a fast, inexpensive and tight co-evolution with the systems they are using (see a.o. Mørch 1997, 2002). "End-User Development can be defined as a set of methods, techniques, and tools that allow users of software systems, who are acting as non-professional software developers, at some point to create, modify or extend a software artefact" (Lieberman et al., 2006). The shift from the discourse on the flexibility/tailorability of software systems to the EUD paradigm can be characterized by the slogan: From 'easy to use' to 'easy to develop'.

To enable systems for EUD, they must not only be made considerably more flexible but they must be easy to understand, to learn, to use, and to teach, as well. Also, users should find it easy to test and assess their EUD activities. To provide users with EUD-enabled IT systems, Lieberman, Paternò and Wulf discuss three main strategies: flexibilisation of technology, intuitive interfaces and appropriation support (Lieberman et al., 2006).

Mørch (1997) suggests three levels of end user tailoring: customization (selection of predefined options), integration (plug in new functionality), and extension (write new functionality). Furthermore, EUD should be seen as a collaborative task between different

stakeholders of a software system. Mørch and Mehandjiev (2000) understand tailoring activities as the collaboration between designer and users mediated by the artefact itself. Influenced by the research on OTD, Helge Kahler and Volkmar Pipek suggest that EUD activities should be supported by the building of communities in which end users can effectively share their EUD-related knowledge and artefacts with their peers (cf. Kahler, 2001; Pipek, 2005).

According to the insight that tailoring is a social and cooperative activity within organizations in which not only single IT users take part but groups of users, tailoring has to be embedded in enabling and supporting organizational structures or a “tailoring culture” (cf. Henderson & Kyng, 1991).

Participatory-Design projects and user-centred R&D activities have been fostered by the European Commission and national research programs. Recent EU research programs take EUD projects into consideration. Further insights into participation issues can be found in the consumption chapter of this report. Referring to the original assumption (hope) that participation of workers and users of ICT in the work domain contribute to democratization and to the quality of working life, one has to reflect on the ambiguous potential of participation as a management paradigm rather than as a living “tailoring culture”. Despite the strong European tradition of fostered PD and EUD projects, with respect to this participation culture sustainable measures for the support of participation seem recommended.

4.4 Information & Lifelong Learning

Within the chapter on Social Capital, we discussed how (ICT-based) networks could contribute to learning in the work domain. In this chapter, we mainly want to show in which type of developments of the work domain learning becomes necessary. The type of learning and related technology will be presented in the domain report on Life-Long Learning.

Since the works of Schumpeter (1911, p. 12), it has become clear that innovations do not only require new ideas (inventions), but also complex and risky diffusion processes. These often demand much from the affected actors, in particular, in the work domain. The Diffusion of Innovation Theory (DOI) (Rogers, 2003) explains innovation processes in the traditional economy, where the manufacturer produces an innovative product which diffuses via different channels in the target markets. In this perspective, customers are perceived as passive.

In contrast, the Lead-User conception (von Hippel, 1986) characterizes the costumers not only as adopters, but also as inventors. This is in line with findings about changing consumer habits (see: prosumption in the domain report on consumption), which are targeted here as a challenge. Creativity among users can be useful for identifying new products and services, which may benefit clients and vendors alike. Chesbrough (2003), therefore, argues: “Firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as firms look to advance their technology”. According to this conception, innovations can be co-created in “value-webs”, networks of different stakeholders such as users, hobby developers or R&D institutions.

The idea of Open Innovation (OI) is related to shared platforms (OI spaces), where new customized products or services can be created, developed and discussed (Piller et al., 2004). This provides the participants with the chance to come into contact with novel ideas, knowledge or technologies that are created from various stakeholders with heterogeneous cultural backgrounds. It is then only within related processes that ideas on possible demand and possible products emerge, not before. The collaboration of the various actors on maintaining and developing their shared platform allows them to discuss and test products that have the potential to grow to innovations on rising markets (Reichwald & Piller 2006).

One might think that related conceptions play only a minor role in the work domain, and, in fact, they are not at all dominant ones in all sectors. However, when looking at the ICT branch, it is interesting that, for example, IBM handed its development environment Eclipse (a platform supporting the development of software) over to the legally independent Eclipse foundation, which maintains and develops its core further. Other enterprises may use the open-source development environment to develop independent products. When enterprises develop open-source products themselves, they may use them as a basis for commercial service offers built upon them. Eclipse has become number two in user (in this case: developers) numbers and is still growing. At the same time, it has developed a public sphere, where product ideas can be presented and commented upon. There are various other examples.

This shows that the distribution, service and maintenance of products changes (tele-maintenance is only another example). Change can be supported by related production conceptions such as modularization and mass customization. The ideal of such conceptions is a core system which can be applied easily to customers' demands by means of configurations, "plug-ins" or similar tools, with an architecture of components which, when assembled in a different manner, functions as another core system. ICTs often play a core role within such conceptions.

Other changes of similar importance and ICT-relation are happening in logistics and in marketing. For instance, value-creation can be increased if not only physical products are sold, but "complex products" with additional services, as well. For instance, when selling a boat, maintenance and a berth for the boat at a place of choice can also be offered. As already mentioned, conceptions like those described are not yet adopted in all sectors, but related change is practically everywhere.

Even in agriculture, strategies to combine production with service (for example, offers for farm holidays) can be seen as complex-product strategies. And again, ICTs play an important role (a farm holidays website, for example). More advanced applications in agriculture are "Animal Registration, Milk Recording, Quota Management, Milk Analysis, Fertility Analysis, Bull Selection, Premia Planning and Applications, Herd Register; Grass Measurement and Budgeting, REPS and Nutrient Management, Maps, Tracking of Inputs, Flock Register, Accounting Applications, Enterprise Analysis, etc." (Harkin 2005).

It is obvious that such changes may impact the nature of work. In particular, they may sometimes devalue existing competences and demand for new ones, and for ongoing learning. As we have seen in the former paragraph, competence-development may be connected to identities, which thus may also be affected by technology-related change. This affection can be empowering or disempowering (we discussed related approaches in the chapter on participation and empowerment).

It is highly important that people, who are not satisfied with the demanding changes they are confronted with, know that it is not necessarily the measures and strategies dedicated to organize change that are negative: without these measures the situation could be worse. There is little evidence that the use of ICTs in the work domain will start to decline, on the contrary. However, the increasing impact of ICT in the work domain does not determine the results of this process. Special ICT-impacts are hard to be identified, as ICTs are only one aspect of socio-technical change. Whether this change is for the better or the worse, depends on the circumstances: one therefore has to look at the different types of ICT adoption in order to become able to evaluate them. In any case, to convince people that change can be beneficial for them, they should be empowered within the organization of change.

We have described that work changed rapidly during the last decades, and that the related learning processes could be a challenge for the identity of individuals in the work domain. Related habitual learning processes have caused a discussion in ergonomics and sociology,

for example, the term of self-economization has been discussed within seminars (Nitzschke 2005). When discussing this issue it is important to keep in mind that it discusses one side of personal autonomy. For example, an individual becoming an adult needs to increase "self-economization", as it is no longer the parents who bring inefficiency on the agenda, but the impacts of one's own actions. Everybody surely knows an example at stake.

However, there may be excessive demands on the individual, in particular when they are related to socio-technical changes, on which the individual has only limited influence. A related discussion is on the emergence of the "labour-entrepreneur" ("Arbeitskraftunternehmer") (Pongratz and Voss 2003), who combines operative and managerial functions in one person. The latter ones make him/her, in a way, the boss of him-/herself. This demands for related competences, on the one hand in his domain, on the other in self-organization. The latter includes demands of discipline, rationality of time management, ability for lifelong learning, technological skills and abilities to represent own competences to others.

There is little doubt that related demands on employees exist, but to what extent they will become a dominant form for a growing, identifiable group of the workforce is much debated issue. While the "labour-entrepreneur" can be a means to externalize (better: individualize) management costs, on the other hand, he is a problem for enterprises, as the highly flexible "labour-entrepreneur" is hard for them to be assessed and controlled. Furthermore, warranty is often based upon certified standards, among them certified training qualifications of the employees. However, the fully flexible learning-by-doing of the "labour-entrepreneur" is not yet often estimated by certification organizations, and certification-using ones.

This means that, on the one hand, the "labour-entrepreneur" will not become the only form of the Knowledge Worker. On the other hand, it makes understandable that the typical "labour-entrepreneur" is mostly to be found within those parts of the ICT sector which do not follow a mainly cost-oriented rationalization conception. Furthermore, his/her future must not necessarily be outside the *system of professions* (Abbott 1988); it could also be partly a change, partly an exception of it. Related problems have been described as related to work-life balance and stress.

In respect of these problems, the growing importance of knowledge will contribute to social change. However, there was no "natural" situation in the past with perfect work-life balance and without stress, which now becomes replaced by chaos. Instead, former problems related to stress and work-life balance have been replaced by new ones. Furthermore, the wide variety of competences demanded for the "labour entrepreneur" makes individual failure possible and a related differentiation of knowledge work highly probable. And again, it will be qualifications which count. Measures to support life-long learning will probably not hinder the further differentiation of knowledge work, but it is extremely important against its cumulative downgrading.

Self-learning platforms such as CMS (content management systems), CBT/WBT (computer/web-based training) platforms, and even more CSCL solutions, which allow for computer-supported collaborative learning, are increasingly used and have a lot of potential for eLearning in the working domain, too (who is interested more into related technologies and conceptions, is advised to look into the related domain report on Life-Long Learning). Related technology is of particular benefit when used to enrich established forms of vocational education, as the combination of ICT-based and face-to-face learning elements ("blended learning") is very advantageous.

Due to the qualification demand described above, the European Commission has undertaken a lot of activities. A long-term e-skills agenda on behalf of the European e-Skills Forum, the ICT Task Force and the Thessaloniki Declaration has been adopted. Within this agenda, the following proposals have been made:

- Long-term qualification management should be supported by multi-stakeholder partnerships to monitor supply and demand, anticipate change, adapt curricula, attract foreign students and high-skilled ICT workers and promote ICT education
- Public and private investment should be ensured in human resources and e-skills, transparency and recognition of qualifications and certifications
- ICT careers should be made more attractive to young people, especially girls
- Initiatives for digital literacy and e-competence in the public and private sector tailored to the needs of the workforce and underemployed, elderly, poorly educated or handicapped people should be adopted
- Lifelong acquisition of e-skills by more user-centric ICT-enhanced learning and training approaches should be supported, good practices promoted and successful forms and business models publicized with a focus on SME (COM 2007 496)

These proposals were adopted “as an inspiration for the development and the implementation by each Member State of a consistent long-term e-skills strategy within the framework of their respective political, legal, budgeting, educational and training systems. It is their responsibility. The Commission will regularly monitor and report on progress” (*ibid*).

Furthermore, the Commission proposed five action lines at the EU level for the time between 2007 and 2010. Related EU instruments were the

- the Lifelong Learning Programme, in which the Grundtvig programme aims at adult learning,
- the Competitiveness and Innovation Framework Programme,
- the Seventh Framework Programme for Research and Technological Development,
- the Structural Funds available for the promotion of Employment and Regional Cohesion, and
- the European Agricultural Fund for Rural Development in the framework of the approved rural development programmes of Members States/Regions for the promotion of ICT, employment and growth in rural areas.

Cooperation with the European Centre for the Development of Vocational Training (Cedefop) was seen as a means to actively link e-skills activities to vocational education and training and to lifelong learning (*ibid*).

In spite of the high importance of qualification given, the Commission had to criticize skill shortage as an important constraint for work efficiency gains: “Between 2000 and 2004, ICT skills in the labour force did not significantly increase: the share of ICT specialists remaining constant around 3% and people with more general IT-skills remaining at around 18%” (EC 2006). Furthermore, there was strong heterogeneity in Europe on this issue.

In this context, it is important to remember that the increasing importance of informal learning does not necessarily mean un-institutionalized learning due to two reasons: learning often, for example, in applications, has to be demonstrated by certificates. Furthermore informal learning may contribute to a sort of inclusion/exclusion vicious circle, as those who are employed continuously learn-by-doing, whereas those without work do not (Nett & Wulf 2005).

Another issue of importance is the ageing society, which can become a problem for the workforce. Therefore, elderly should be supported to stay at work. ICTs could play a role in this support, and in limiting the shift from work to retirement, too. “Evidence shows that people with low education, if provided with digitally literacy have a 5% higher likelihood to be

employed, and have in average 5% higher wages. When looking at males between 50 and 64, the likelihood to be employed when having experience with ICT goes even up by 20%" (E-Inclusion 2008). However, if there are no ICT skills among the elderly workforce, there is again the danger of a vicious cycle.

In the mean time, the Presidency of the European Union Council (2008) recalled that digital competences have become more integrated into the education of individuals in a context of life-long-learning. However, digital competences should be further promoted through vocational and continuous training as well as through measures in support of the elderly. Social intermediaries who are in regular contact with the target groups should play an essential role and be trained and supported by the public authorities (Presidency 2008)

The Presidency of the European Council saw community centres as important, in particular for poor, socially isolated persons or those who otherwise are at risk of social exclusion. Both public and private employers contributing to ICT training of their employees should be encouraged, for example, through taxation incentives. Digital literacy programmes should prevent new digital divides in access to and use of information by increasing trust and confidence in the use of technology and in new forms of participation through social networks (*ibid*). This has to be underlined.

4.5 Discussion

We have shown that ICT today plays an important role, however, not the only important role in the European work domain. Generally speaking, ICT has become important in more and more sectors and today it surfaces in practically all sectors. Therefore, the EU has taken a lot of measures to improve ICT infrastructures. Although there remains a lot to be done to avoid an increasing gap in connectivity, undeniable successes in establishing, for instance, fast internet connections should not make one focus on infrastructure alone.

Aside from infrastructure, other factors have been detrimental to the improvement of ICT adoption, for example, lack of (more advanced) ICT skills, but also too strong a focus on cost reduction in white collar work. In practice, ICTs are not only affecting white collar work. However, they are often invisible in the work domain, as they are embedded in tools or other systems.

There are systematic efforts dedicated to such embedding of ICTs, for example, in ubiquitous computing, which can strongly affect the work domain: imbedding ICT can be supportive and empowering for those who have to use technology, among them white and blue collar workers, but it can also replace work by automatization. When analyzing impacts of ICT, it has to be kept in mind that the circumstances of technology implementation and the nature of the concrete ICTs at stake are highly important.

Using ICTs may contribute to more productivity, if it is related to organizational development. This process is complex and problematic for many enterprises. Often there is too much focus on technology without considerations about their impacts in the given situation. This implies the danger of concentrating too much upon cost reduction *ceteris paribus*, instead of addressing new markets by using the assets of the company, among them, the competences of the workforce.

When addressing the impact of ICT on the work domain, new working forms, which have emerged in the context of ICT use or development, have attracted much interest. The most prominent example for the enabling potential of ICT on work is telework. Related statistics on ICT-supported work were generally restricted by definition to remote work and did, for instance, not cover aspects of tele-cooperation. Research showed that ICTs impacted work by enabling individuals to choose the place where they work much more freely, but that the proportion of telework increased only slightly in last decade.

When one adds to that the fact that the majority of European workforces still spend all or almost all of their working time at company premises, it seems as if there was little impact of ICTs on the work domain. However, the share of working away from the workplace is greater than the share of telework. That means that telework is not covering the whole picture of ICT at work. In contrast to telework, the concept of eWork takes into account forms of ICT-mediated tele-cooperation.

The share of workers involved in tele-cooperation is much higher than the share of workers who are teleworking. Such as telework, tele-cooperation is much related to white-collar than to blue-collar work. It can enhance work productivity and innovative work performances. eWork obviously is ambivalent in relation to working conditions. Its dark side consists of possible social isolation, lack of access to social resources, forms of work control, greater stress, longer working hours, work-life imbalances, information overload, musculoskeletal and ergonomic issues. On the other hand, eWork may contribute to work autonomy, workers upskilling, variety of tasks and skills, and access to highly qualified jobs. The effects of eWork depend less on the technology used than on the organizational circumstances.

Using ICTs demands for skills, which may be new for the workforce. The skills demanded are heterogeneous. Aside from operational, media, and information skills, strategic skills are one part which includes, on a very basic level, competences of self-organization. ICT use in the work domain has been described as enabling more self-organization. Related ideal types such as the “labour entrepreneur” have competences of operation, management, self-staging and media use. However, real individuals often differ from ideal types.

In the work domain, therefore, there may be differentiation between knowledge and other work, but there also is differentiation within knowledge work. Knowledge work can even be related to precarious employment. One case at stake is the call centre. Even call centres could be used to improve service and product development; this could only be done if the focus is not on short-term cost reduction, but on long-term innovation.

For long-term innovation, consumption plays a central role, as products and services have to be used, if their delivery is to be sustainable. In fact, consumption has changed considerably during the last few decades (see the report on consumption). The example of using open-source products to establish related services is an interesting case showing that tertiarization does not necessarily imply the end of industrial production. On the contrary, related inter-dependencies between services and technology can be very successful, even if demanding industrial production. To combine related conceptions such as complex products, open innovation and end-user development with production strategies such as modularization and adaptability has a lot of potential. However, this demands for (abilities of) organizational development, as organizations have to become able to learn from the customer (for example, open innovation)

The success of Web2.0 technologies shows that usability is a core issue for ICTs as products. However, usability is only partly a general technology feature; it is also related to technology appropriation. In this context, socio-cultural communities such as sub-cultures play an increasing role in consumption: what is a good form of technology use for one community may be unacceptable for another. In this sense, the consumer is more demanding, and the markets have become more differentiated.

The trend described is very demanding, in particular, for large bureaucratic organizations. Therefore, more flexible forms of organization have been established very often. Nevertheless, increased flexibility does not necessarily imply deregulation. If the workforce is to support flexibility and efficiency, it needs guarantees of social security and inclusion. If established related guarantees are abolished or undermined, new forms have to be established. One related conception is discussed in Europe as “flexicurity”. However, there are conflicting interests related to the concept and related different understandings.

Technological change has been extremely fast during the last few decades. It fascinated the youth, a part of which, in the mean time, has become much better educated in practical, technological terms, too (although there is still much to be done). However, the engagement and knowledge among the young workforce implies the danger that instead of qualifying existing staff, fire-and-hire strategies could become accepted in Europe. This would be unfair for the elder employees, detrimental for situated competences of the enterprises and problematic in regard of the tendency towards an ageing society. But it is not a natural impact of ICT, which in contrast could be helpful to support elderly and to make the step between work and retirement less steep (if in the latter case, there are no ICT skills, this might not only exclude from work, but from inclusion measures, as well).

If we come back to the socio-cultural communities playing a stronger role in consumption, this trend is not only a problem for organizations, it can also be beneficial for them, as the success stories already mentioned show. Trust is an important issue at stake, as it can be the basis to identify and develop social capital. Communities which share a common identity, shared practices and symbols, this is: Communities of Practice (CoPs), have a large potential for the exchange of knowledge, which otherwise (for instance by merely technological means) often is highly problematic. The same is true for Networks of Practice (NoPs), which may (like CoPs) be supported (but not replaced) by ICT.

Self-organized forms of qualification such as CoPs and NoPs can be important means to support learning. However, the more flexible learning demands become, the more flexible institutional arrangements are needed to certificate qualifications. The increased importance of informal learning is not necessarily an argument for un-institutional learning.

A lot of activities have been adopted by the European Union and others to promote ICT-skills and to combine ICT implementation with measures to support the quality of work and job satisfaction by means of job enrichment, reduction of risks, and by securing privacy. These are very important. **However, e-Exclusion does not only exist on the level of technology use, but can already appear in technology development.** For instance, opportunities for ICT appropriation demand for adaptability of technology. Therefore, a lack of skills among the workforce is only one possible danger when implementing ICTs in the work domain. A danger becoming important is the choice of technology to support the competences of the work domain, which are not always fully visible.

To address the latter danger demands for a responsive form of innovation. There is a long tradition of related participation and empowerment conceptions in the European work domain. Participation of workers in technology development can be an important measure, even a precondition for job-enrichment. Participatory Design is not artificially imposing context-independent technology and then asking for the one-sided adaption of humans, but has attempted to unveil competences and opportunities together with the workforce, which otherwise may remain invisible. In this sense there may be e-Exclusion on the production side, too. Participatory Design can support the qualification of producers and customers, as well, and help to identify valuable products and opportunities to better use existing assets of the companies. Generally speaking, competence development should not only be addressed as an individual obligation, but also be addressed when developing ICTs to support humans in the work domain.

5 Policy implications

The European Union has played an active role in the promotion of the Information Society in Europe. Differences between national regulatory rules of the European telecom market have been harmonized and more competition and transparency has been established. Fast internet connections were promoted with considerable success. An important measure was the integration of the individual right of privacy into the European Convention of Human

Rights and Fundamental Freedoms. Related measures were applied for data protection and communication. When in the work domain, RFID technology turned out to have great technological potential, but could also become a problem for privacy, necessary recommendations were adopted.

Additional efforts for e-Inclusion have aimed at, for instance, aged, disabled or disadvantaged persons and should improve general accessibility, skill formation, socio-cultural and geographical e-Inclusion. Together with the efforts aiming at sustainability, the described measures made ICT use in Europe more safe and accessible when compared to many other parts of the world. Related efforts should be continued and elaborated further.

However, informatization is neither an end in itself nor a pre-given path of development; rather, development should be considered as a means to tackle social problems. The further evolution of information technology can hence not be addressed in a technocratic, "instrumentalist" manner as described in the conceptual framework. **Instead of 'imposing' technology upon people affected, the dignity of producers, consumers and workers and their right of self-determination has to be respected, in particular when developing and implementing technology, which may influence future interaction.**

In the work domain, a world without ICT today can hardly be imagined and it has become difficult to find an area of work which is not somehow affected by ICTs. However, it needs to be pointed out that e-Inclusion is not the same as social inclusion. The broader aim of social inclusion should not be forgotten when discussing the important aim of e-Inclusion. In order to avoid this danger when focussing on the social impact of ICT, one should not only concentrate on the most visible phenomena, but consider less visible ones, as well. **This implies a plead for more differentiated research, comprising, for instance, case studies and living labs, to investigate more complex and hidden inter-dependencies of ICT appropriation.**

Research on the (potential) role of ICTs for more peripheral parts of the European society should be even more supported by the EU, for example, **the impact of existing ICTs on (remote) blue-collar work and agriculture.** Such research should be inter-disciplinary and could be used for formative evaluations (action research) - as is already attempted in many EU-funded projects. However, within these projects, the formative elements should be strengthened, the tendency for "technological fixes" avoided.

As different as the sectors, in which ICTs have become important today, are the roles they can play: they can be developed to automate standardized processes, but also to support creative customer-oriented services. For the latter purpose, analyzing appropriation processes of products can be a means to identify creativity among customers, emerging new demands, competence deficits on the demand and the supply side, and opportunities to technologically support appropriation problems. This great innovation potential is not yet fully exploited, partly due to lacking competences and awareness to analyse the relation between ICTs and social practices. As a result, **automation still is a most powerful paradigm in spite of the striking counter-examples that show the potential of creative services.**

Therefore, scientific research on the inter-relations between ICTs and social practices should be further supported and placed more in the centre of European innovation politics. Even more efforts should be devoted towards research on a possible supportive role of ICTs for ecological sustainability, gender mainstreaming, active ageing, and, in general, social inclusion. To support the latter, **research into trust and possible boundary spanners in peripheral sectors and parts of the European work domain could help to identify possible starting points for the diffusion of ICTs to prevent a further digital divide in Europe.**

The orientation towards "real-world" social problems can be promising if it is not seen as a one-way street from ingenious developers to passive users, which only after development and implementation are to be adapted to the new technology by training. Instead, methods of

Participatory Design should involve affected users during the processes of defining and developing applications. **Programmes for particular groups of people, for example, the aging population or ill persons (eHealth), should be organized accordingly and be intensified.**

As ICTs are constructed increasingly in a modular way (for example, as elements of development environments), End User Development becomes increasingly important. It generates new opportunities for the adaptability of ICTs – if technology appropriation is considered in necessary detail to avoid an overburdening of the users and to secure usability. Boundary spanners can play an important role for the diffusion of related technologies. This means that the promotion of related technology needs to be accompanied by **measures to make producers of ICTs aware of the skills and appropriation forms of their (possible) clients.**

Regarding the promotion of technology, the improvement of infrastructure has played a decisive role. There is still a lot to be done to make fast internet accessible all over Europe; but in general, related efforts have been quite successful. However, the enabling effect of a fast infrastructure can be achieved in Europe only if there are promising applications. As has been previously shown, such applications do not come by themselves: they need careful elaboration. For e-Inclusion reasons, the implementation of fast internet access all over Europe should be continued, but it should be accompanied by the development of promising applications, which should move even more into the centre of European efforts. This is to say, **it must not be lack of bandwidth or of operational performance which hinders innovation, but a lack of usable applications which are capable of supporting the competences and satisfying the needs of the users can also be a hurdle.**

Structural policies in Europe strongly related the promotion of ICT in the work domain to increase flexibility. This has often been seen as a de-regulation of the work domain. However, flexibility does not necessarily mean de-regulation. In contrast, appropriate regulations can, to a certain degree, improve flexibility and social security at the same time. Related conceptions have, for instance, been discussed in Europe under the heading of “**flexicurity**”, but there are still a lot of different interpretations of this term: some see the concept as an attempt to undermine labour stability, others see it a specific model of part-time work based on Dutch or Danish experiences, still others see it more as a necessary adjustment to flexibility demands of the market.

As this report only concerns the impact of ICTs, this is not the place to discuss the flexicurity discussions in detail. However, if one considers the correlation of the spread of ICT and labour flexibilization, there is a certain overlap of both fields. To give an example, many jobs in the software branch demand for ongoing learning, and some of them are liable to temporary employment. As learning in this field is mostly accomplished on-the-job, those who are permanently employed improve their qualification while the unemployed fall back (similar tendencies can be found in other sectors, as well).

Established institutions for advanced vocational training often do not have appropriate offers for this clientele and, accordingly, much of the related qualification is transmitted by informal learning. Nevertheless, informal learning does not necessarily imply non-institutional learning: certificates available at institutions sensitive for recent market demands could possibly contribute to an attenuation of the loop of deficient competences and unemployment.

The example shows the need, not any implicitness, for policy measures that reorganize social security, as soon as work becomes more flexible. Research shows that flexibility has increased in the European work domain, although with considerable geographical differences. For example, work flexibility had positive effects in regions, where flexibilization has been strictly separated from deregulation. In this context, ICT could play a positive role, for instance, in dealing with the variety of working forms, or for easing the shift between working forms. ICT-supported part-time work, for example, could make the step from work to

retirement less steep and improve active ageing at work. However, this would require related regulations which assure social security.

With regard to the impact which digital skills and their continuous upgrading have on employability, there is much evidence that ICT-usage is becoming a standard requirement for nearly every work activity. The improvement of the digital skills of Europeans workers has been declared as a central policy domain in achieving the objectives of the Lisbon strategy (Eurofound 2007a), and many initiatives have been launched by the EC in the last decade to avoid forms of e-exclusion at work, and to promote digital skills-development.

If one demands for training efforts to accompany the implementation of new technology this is positive, but not sufficient: already the decision for a certain new technology has to be made on the basis of a sound identification of the competences available, instead of putting technology first and then demanding related adaptation from humans. This, however, requires a **closer connection between the development of applications and organizational development in the enterprises, e.g. for the development of those ICT which are suitable to promote active ageing in the work domain.**

Besides this, digital-skills development regarding work is not only restricted to ICT training and qualification-measures at the company level. Critical media skills and strategic skills have to be part of related education. Digital skill development thus is a challenge for education since it has become a central factor for career development of employees and the competitiveness of the European labour market. Policy implications for the work domain are strongly related to educational issues. Lifelong learning, for instance, does not start with entering the active working population, it starts at school or even before. Thus, **policy makers are advised to emphasize basic digital skill development on the educational level and to ensure that the educational domain can cope with the rapid development of ICT.**

In the context of **competence-sensitive technology policies**, it is important to note, that competences cannot always adequately be identified by describing formal qualifications, but instead an analysis of work practices behind formal work flows is required. If technological innovation and organisational development should go in hand, reflexive and careful technology policies on the educational level and on the enterprise level are necessary – but related support from the engineering and socio-political realms as well. To allow for this, the education of engineers should include more “social” issues. **For EU-funded technology projects, it should become imperative to transparently identify the competences of the actors before, during and after the project.**

Automation can play a productive role when it frees work from boring or unhealthy routines. However, automation can also be implemented to replace decent work by machines. If automation becomes decisive for economic development, the overall value added necessarily has to decline as a consequence of the increasing productivity of labour. A related development could become self-destructive.

In order to avoid such self-destructive processes, new products and services need to be developed and organized in a manner that is sustainable and considered legitimate by the European citizens. Related development conceptions such as service-based Complex Products, User-Innovation, Mass Customization and Flexible Specialization may play a positive role. But as they are based upon more flexible relations between producers and clients, this demands for perpetuated training efforts of the staff, related qualification of skills and, in many cases, job enrichment. **Structural policies dedicated to support this type of organizational development, project funds, in particular, should place these competence developments at the very centre.**

ICTs may contribute to Organizational Development in industry. Europe has a strong tradition of **participative forms of Industrial Relations** and related forms of engineering, which should be revitalized in the years to come. However, the development of supportive ICTs

needs more awareness and support. Policy measures in this direction could be a central contribution to social inclusion in Europe and the positive development of its work domain.

6 Literature

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[D] Consumption (incl. media and entertainment)

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0 Executive Summary

Purpose and scope of domain report

Full participation in society is partly determined by an individual's ability to be an informed and active consumer of goods. This consumption is instrumental when consumption satisfies basic needs such as housing, food, health services, utilities, and transport. However, consumption can also be emotional to improve quality of life beyond basic needs or provide relaxation and entertainment. With the increasing importance of ICT in consumption, entertainment, instrumental consumption and information consumption have become more intertwined.

This domain report covers both **instrumental and non-instrumental forms of consumption**. It describes general trends, which indicate that consumption is increasingly an experiential practice; the report draws on the associated Eurobarometer 241 report for additional data regarding the instrumental and recreational uses of the Internet. Three general areas of concern are reflected in this domain report: First, the importance of the **collapsing and expanding space and time dimensions** of consumer behaviour; second the **blurring boundaries between consumers and producers**; and third the role that ICTs play in **supplementing or substituting existing forms of consumption**. It discusses these areas from the perspective of the consumer and includes significant developments for producers and intermediaries only in relation to how this affects consumer behaviour and experience. The domain report covers consumer goods, both tangible and intangible, but excludes services provided by the government and business-to-business interactions.

This domain report discusses the most important social trends that have taken place in Europe in relation to consumption and then analyses the impact of ICTs in specific areas of consumption. The report draws on the overarching themes of rationalisation, networking, empowerment and participation, social capital and information and lifelong learning to structure the findings.

Key findings

The share of Europeans (EU27) who ordered goods and services online at least once in a three month period has increased from 15% in 2004 to 28% in 2009¹. A considerably larger number of Europeans use the Internet for finding information about goods and services pre-purchase: Their share has increased from 34% in 2004 to 51% in 2009.

A few areas of instrumental consumption have seen a **massive shift to online transaction**, which to some extent has replaced brick-and-mortar retailing. Examples include **consumer financial services, travel services, recorded music, and computer software**.

ICTs and the Internet have **reduced the costs of many types of transactions**. In particular search costs have fallen dramatically, which has made 'shopping around' much easier. The Internet has thereby enabled new markets which had not been sustainable before because of prohibitive transaction costs. However, perceived problems with delivery and post-purchase service of online retailers mean that many consumers feel face-to-face settings give more confidence.

The spread of ICTs is also related to the **blurring of boundaries between consumers and producers, and between consumers and retailers**. It has become much easier for consumers to produce and sell as well as to passively consume. 10% of Europeans (EU27)

¹ Source: Eurostat survey on ICT Usage in Households and by Individuals

have used the Internet to sell off goods or services, e.g. via online auctions, in 2009 – twice as many as in 2004². Web 2.0 technologies have also given consumers unprecedented opportunities to join into communities of interest, to contribute own content related to products and to create new products in collaboration, all of which were previously the realm of experts. The term ‘prosumer’ is used to describe this phenomenon, which is linked to a general increase in interactivity between consumers and the production system.

Epochal trends

In the first section, the report reviews the most important social trends in relation to instrumental and emotional consumption with minimal reference to ICTs in describing these trends. The discussed trends and changes affect the relationship between consumers and producers, the development of consumer behaviour, and the roles of consumers in society.

Relationship between consumers and producers

In the relationship between consumers and producers of instrumental and emotional products two main general developments can be observed: globalisation and localisation might seem to exist on opposite ends of the consumption scale, but they have taken place at the same time: while on the one side the concentration of production in big global and multinational companies has accelerated in the past decades, there is a growing supply of local, personalised services and socially responsible consumption.

Developments in consumer behaviour

In consumer behaviour there is a shift towards consumption at home (“domestication”) and the integration of consumption in other everyday activities. The supply of local, personalised products and services reflects the demand for such products and services by consumers, who increasingly value niche-products and markets.

Consumer rights and (industry and government) regulation to protect the consumer from fraud and deception have all been stepped up in the second half of the 20th century. Consumers have become more conscious of the effect of consumption on the environment and other global issues and demand more information about the origin and social responsibility of producers of good. Consumer behaviour and organisation is related to consumer empowerment.

Changing role of the consumer

The changing role of the customer is characterised by the blurring of the boundaries between consumption and production and a new focus on amateur production. The continued integration of consumption into the domestic sphere has allowed individuals to appropriate a larger proportion of the consumption process. Two trends can be observed since 1970: The commodification of consumption activities and the blurring of the boundaries between commerce, entertainment and learning. In addition, consumers are more frequently producers of content at the same time as consumers and engage in co-creation and crowd-sourcing. Consumer and media literacy have emerged as critical and essential skills for both consumption and production.

² Source: Eurostat survey on ICT Usage in Households and by Individuals

Applications of ICTs in consumption

Supplementing existing forms of consumption

The guiding question for the analysis of the social impact of ICT is how new technologies reconfigure what consumers do and how they do things. The empirical data of the Eurobarometer 241 report suggests that new ICTs are **supplementing historic forms of consumption rather than substituting them**. Other surveys show that the use of new media for emotional consumption over time is more evolutionary (ie. gradual) than revolutionary. In the UK, for example, entertainment related activities increased only marginally.

Re-intermediation

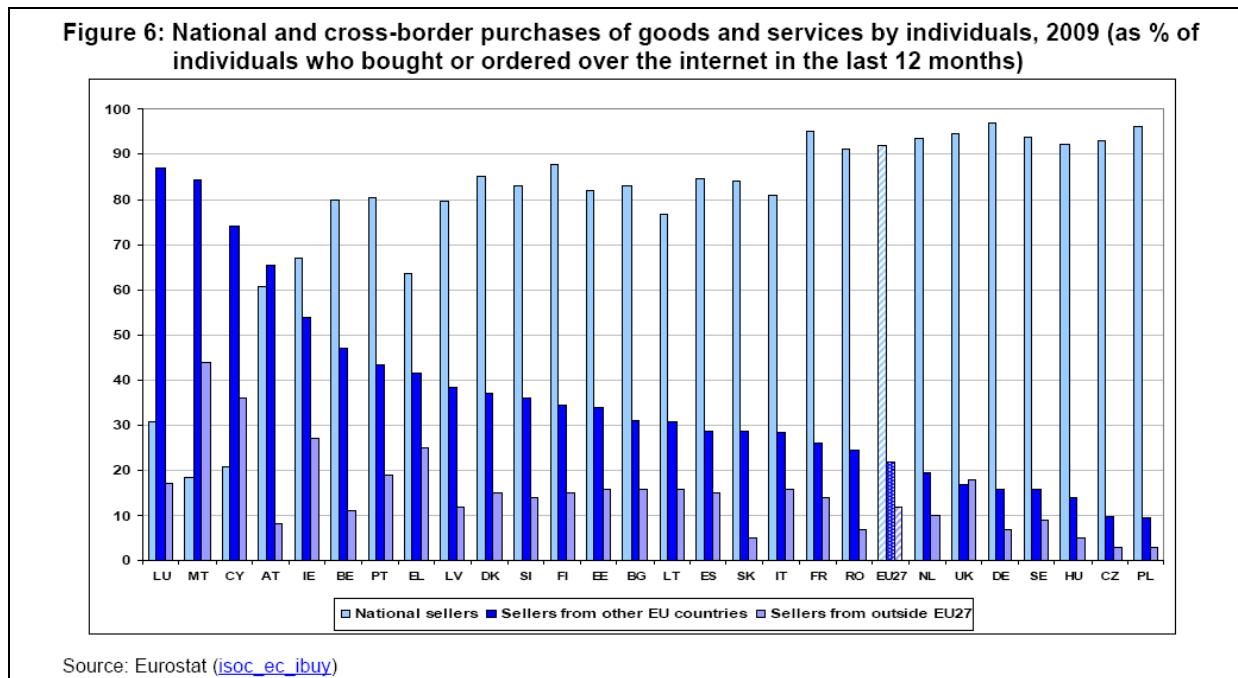
The predicted death of the intermediary by an assumed preference of consumers for self-service and the related price advantage could not be confirmed. There is more consistent evidence for re-intermediation and explosion of intermediation points in digital markets than for the opposite.

Reduction of transaction cost

ICTs and the Internet have been shown to reduce the costs of many types of transactions. In particular search costs have fallen dramatically. The **Internet has thereby enabled new markets**, which have not been sustainable before because of prohibitive transaction costs – a typical example of market failure. The decreasing transactions costs, e.g. for identifying a person interested in buying a used book, and the cost for finding a copy of a book on the second-hand market have created new markets, which are beneficial for consumers.

Globalisation and domestication

Consumers also have access to products from major markets such as the US and China, which they can find and order over the Internet relying on the global infrastructure of digital networks, payment mechanisms, and shipping services (see Figure 1). Consumption can take almost any place where a connection to the Internet can be established. This expands the sphere of domestic consumption to a wider concept of “home”, which manifests itself e.g. in people talking on their mobile phones in the supermarket inquiring about the family’s needs for groceries.

Figure 1: National and international purchases, 2009

Source: Eurostat Data in Focus, 46/2009: 4

Interactivity

The Internet brings consumers together and allows for interactivity in what used to be broadcast consumption by enabling messages to flow directly from producers to consumers rather than being mediated by traditional mainstream media outlets. In the entertainment industry, online fanzines and websites dedicated to specific movies, bands, or shows supplement the existing professional critics' evaluation in more mainstream media. Evaluations are available to all. Professional critics and official representatives of consumer groups have seen their role in consumer protection issues diminished. If a consumer is unhappy they cannot only feed this reaction directly back to the producer but also to other potential consumers. Virtual Brand Communities can have positive effects by amplifying a brand's reach, but can also be used by consumer groups to exercise pressure on a brand's producer.

The rise of the prosumer

It has become easier for consumers to produce and sell as well as passively consume. The term "prosumer" is used to describe this phenomenon linked to the rise of interactivity. In the UK in 2009, a considerable number of Internet users had sold products or artefacts online. This is not universally popular across Europe however. There is some indication that the consumer-to-consumer environments are becoming professionalized with small businesses and larger producers selling products on the same sites.

Tracking of consumer behaviour

Most websites offering products and services ask consumers to disclose an ever-increasing amount of information. Larger websites have figured out ways to gather data with or without the consent of the consumer to tailor the product offerings to the consumer needs.

Social Impacts of ICTs

From these trends and the applications of ICT in consumption, the report has identified five main social impacts. It would be wrong to argue that everything changed dramatically the day the Internet came into the consumers' lives. Most of the changes in consumption patterns have been evolutionary rather than revolutionary.

Domestication and Rationalisation

In practice, the distance-shrinking character of ICTs mean that more everyday activities can now be carried out electronically. This has opened up a range of possibilities for people whose ability to take care of personal business and transactions used to be constrained – for example because of lack of time, because of individual functional restrictions, or because of geographical location in a peripheral or otherwise disadvantaged region of Europe.

A considerable part of emotional consumption is now said to be taking place in the home due to the increase in broadband diffusion. However there is little empirical evidence that ICTs have changed consumers' behaviours significantly. The improvement of data storage capacity means that there is the possibility to mobilise consumption outside the home.

A few concrete examples for the rationalisation of consumption of instrumental products through ICTs are price comparison sites, online payments and home shopping. It is not the case that consumption has moved completely to the more efficient, domesticated types of consumption. For emotional as well as some instrumental consumption other factors beyond efficiency and lower costs have maintained previous patterns of consumption: The emotional experience itself and the higher confidence in face-to-face settings for consumption remain important.

Networking and social interaction

Interactivity and participation in production through ICT are only available to those who have access to it. Once access is achieved relatively high skill levels are needed for participation. Concrete examples of the new forms of social interaction are mailing lists, blogs, and wikis, that enable socialization around a variety of topics, e.g. hobbies like wine, cars, or photography, or celebrity gossip sites.

Social capital - empowerment of consumers

Social ICT and Web 2.0 technologies have also given consumers unprecedented opportunities to join into communities of interest and give direct feedback on products and create new products in collaboration, which were previously the realm of experts. Consumers have access to more information about producers and ICTs have facilitated the organization of consumer groups on a national and international level through instruments like e-mail, discussion forums, social networking groups, and consumer feedback forms.

Disintermediation and Re-Intermediation of informational markets

While in some markets traditional intermediaries such as travel agents have almost completely disappeared, new intermediaries have appeared in others, including price comparison websites or search engines. A concrete example of the substitution of intermediary by new intermediaries is the "Googlization" of search.

Empowerment and Participation: Consumer/producer and entertainment/information boundaries

In 2009, social networking and other "Web 2.0" activities have grown considerably in the UK. Examples include customization sites, which allows customers to decide the design of the

products, advertainment and advergaming as new forms of advertising, and Social Networking sites like YouTube and Facebook, that live from the dissemination of user-generated content.

Enablers and Barriers

The domain report concludes with a discussion of the enablers and barriers for participation in consumption. While the significant easy access to the Internet, the drop in internet access price, the availability of specialised online platforms for consumer interaction and production, and a global shipping and payment infrastructure were identified as enablers for the new consumption behaviour, digital and socio-economic exclusion, information overload, trust, protection from exploitation by big media companies, email spam and viruses, and the concentration of consumer data have been identified as critical barriers that deserve further attention.

Policy implications

The domain report gives several policy implications:

Digital Inclusion

- Government policy for economic participation through ICTs must include the development of digital inclusion policies that focus not only on access but also on **skills and media literacy in relation to consumption**
- There is a strong need for a strategy for **developing consumer skills, in particular targeted at those groups which are most at risk of commercial exploitation, such as children, people with limited digital skills, and people with generally low literacy levels.**

Consumer protection and regulation

- Additional **regulation for consumption** and ICTs besides standard regulation that exists for offline transactions is required **to protect consumers**, as existing institutions like the Internet Ombudsman are not sufficient and their positioning is unclear.
- Technological change has enabled products and patterns of distribution and consumption to become much more flexible, complex and diversified. This has often led to **more choice for consumers, but also to more occasions for fraud and for violation of basic consumer rights.**
- The re-emergence of intermediaries has been one indirect result of this experience, as **consumers seek trustworthy institutions** in an increasingly complex market environment.
- A main area in which policy intervention appears to be necessary is in finding a good **balance between consumer rights, consumer information/education, and the interests of suppliers.**
- Recent years have made it obvious that consumer rights and other (industry and government) **regulation to protect the consumer from fraud and deception have to be modernized** in order to keep track with market developments.
- Technological change can be blocked by deficits in the legal framework: **lack of clarity in consumer rights can hold back e-business** from becoming a mass market.

Copyright law and ownership

- While it is not yet clear if and what regulation is necessary, **if commercial producers start to appropriate the work of the prosumers then some type of regulation might be needed.** Who represents the interests of the prosumers?
- **Copyright and ownership** of professionals over their work is under threat, the most pressing example that of musicians and artists. A blanket license or cultural flat-rate could provide the solution to connect consumer demands with the need to remunerate professional production and offset the negative effects of unlicensed consumption. The **blanket license would provide consumers with legal access to digital material and enable their active participation in the knowledge society.**
- The rapid development of the online economy (as reflected in a continuous emergence of new business models) implies that **people cannot rely on legal frameworks alone** if they wish to participate in the benefits while avoiding the risks of products and services traded online.

Topics of future concern

There is evidence for a consolidation of power in the hands of those who were traditionally powerful. Instead of a diversification of producers, consumers might in an environment of information overload and uncertainty rely more and more on a few well-established, trustworthy producers of well-known brands

Privacy concerns are bound to become more serious in the future, in particular when mobile location-based services become integrated into online customer accounts and smart products and services register ever more consumer data.

1 Introduction

Full participation in society is partly determined by an individual's ability to be informed and active consumers of goods. This consumption is 'instrumental' when consumption fulfils basic needs and acquires physical goods such as housing, food, health services, utilities and transport. However, consumption can also be 'emotional' used to improve quality of life beyond basic needs or provide relaxation and entertainment. This project focuses on both types of consumption. General trends will be described which might indicate that consumption is transforming into an emotion-loaded/experiential practice. Since in the current ICT environment entertainment, instrumental consumption and information consumption have become ever more intertwined, it is seen as essential to include both instrumental and non-instrumental forms of consumption. In more general terms, this domain report focuses on what the associated Eurobarometer 241 report discussed as the instrumental and recreational uses of the Internet.

Three general areas of concern are especially reflected in this domain report, the first is the **importance of collapsing/expanding space and time dimensions to consumer behaviour**, the second is the **boundaries between consumers and producers** and the third is the **role that new ICTs play in supplementing or substituting existing forms of consumption**. It discusses these issues from the perspective of the consumer, while producers and intermediaries (ie. salespersons) are clearly part of the consumption process any significant developments will be discussed only in relation to how this affects consumer behaviour and perspectives.

The focus of this domain report will be on consumer goods, tangibles as well as intangibles, but will exclude services provided by the government and business to business interactions. This means that this domain reflects **consumption of traditional physical products (eg. CDs and books) as well as the most recent consumer products that do not have a physical form (eg. music downloads and online magazines)**. Furthermore, this chapter will focus on the impact of ICTs on the consumer and not on the production process even though distinctions between consumption and production have become more difficult.

This domain report is divided into four sections which will first discuss the most important social trends that have taken place in Europe in relation to consumption, then the arrival of ICTs in this area. This is followed by a discussion of the more recent evolution of and the social impacts that this has had in the area of consumption. The overarching themes of rationalisation, networking and social capital, empowerment and participation, and education and lifelong learning have given structure to this section in particular.

This section will also include a discussion of the barriers and enablers that the introduction of these ICTs encountered. This domain report finishes by discussing the possible impact of ICTs on policy initiatives in relation to consumption.

2 Epochal trends in consumption and the arrival of ICTs

This section will review the most important social trends in relation to instrumental and emotional consumption with minimal reference to ICTs in describing these trends. This section is divided into three subsections discussing changes and trends in the relations between consumers and producers, in the development of consumer behaviour and in the roles of consumers in society.

2.1 Relations between consumers and producers

Two main general developments can be observed in the relationship between consumers and producers of instrumental and emotional products; globalisation and localisation might seem to exist on opposite ends of the consumption scale but they are two developments that have been taken place at the same time.

Concentration of production in big global and multinational companies

Many have written about globalisation of consumption, the rise of large international corporations that have taken consumption from the corner shop to large supermarkets and megastore (Gorter et al., 2003; Pioch & Schmidt, 1999; Wrigley, 2002). The reliance on globally integrated production systems by multinational companies (Dicken, 2007) is an important part of this trend (Henderson et al., 2002). Production is distributed and segmented over different countries and continents depending on where the knowledge and the cheapest labour is situated (Ernst & Kimb, 2002). Not only production takes place in different parts of the world, **consumers now expect produce and products from all over the world to be delivered at their door**. This has naturally led to a concentration of economic power in those organisations and producers that can provide such a global production system and service (Sassen 1995). This means that the products consumers get in, for example, India are now very similar to those that can be bought in Europe and Latin America.

Rise of local personalised services and socially responsible consumption

A counter trend to globalisation of consumption is the continued existence and **increased awareness of locally produced goods** (Nygård & Storstad, 2002; Roberts, 1996; Webster, 1975). Responsible or conscious consumption is driven by a request for more information about products; organic food, fair-trade and other brands that guarantee origin of products have risen in popularity (Goodman & DuPuis, 2002). Local shops with clear provenance which are able to tailor to the personalised needs of consumers have increased in popularity.

2.2 Developments in consumers

The developments described in section 2.1 can be seen at a smaller scale within the behaviours of consumers. The Eurobarometer 241 shows that in 2009 a considerable proportion of Europeans, 60% had bought or sold something online. In the UK there has been a gradual, slow increase in online buying since 2005 so that in 2009 around four out of five Internet users shop have shopped online in the last year (Dutton, Helsper & Gerber, 2009). Selling is a lot less popular but still undertaken by about a third of the population. The World Internet Project has shown that the trends in eCommerce related activities are very varied across Europe and that they depend on the availability of services as well as on general levels of Internet confidence. For example, in Hungary, Amazon stopped its delivery after parcels kept getting lost in the post which means that online books sales were affected.

More general trends in consumption show an increase in domestication of consumption, personalization and consumer professionalisation in the latter half of the 20th century. A brief overview of these trends is given below.

Domestication

Domestication of consumption signifies the **move towards consumption at home and its integration into other everyday activities** (Silverstone & Haddon, 1996). More and more activities that used to be (semi) public activities, such as consumption of entertainment products have moved inside the home or even more starkly, into the bedroom (Livingstone 1998). Belk (1988) links this to the concept of the extended self which argues that products and consumption have become part of the expression of self more than of a functional need for a certain product or service. Consumption can be part of the expressions of the individual self as regards the importance of fashion and personalization of personal objects, but also as regards the increasing importance of the home and the products that consumers buy for their home (eg. furniture and home technology) as part of their perception of self.

It is impossible to see this as separate from the decreased size and price of many technologies such as the television, the video recorder and stereo equipment that have made it possible to have music, video and literature within reach in the home. Economies of scale related to the globalization trend discussed earlier, have made the mass production of these cheap individual use or household ICT possible (Hollestein, 2004) which has facilitated the domestication trend. These combined trends have made home-entertainment one of the buzzwords in this area at the end of the 20th century (Ellis, 1992; Gray, 1987; Sturm, 2004).

Personalisation and the rise of niche markets

While mass production and economies of scale were important to the globalisation of production and the globalisation of consumption and important counter trend is the increased customisation of mass produced products partly due to a consumer quest for personalised, individualised products tailored to personal needs and to express identity through consumption (Belk, 1988; Laverie, 2002). This also relates to domestication where consumption goods are brought into the home and are 'on demand'. The increased registration of consumer data to tailor products has supported these trends of customisation.

After a period of mass production there thus is an increased need and also possibility for niche markets to comply with this trend of localisation and personalisation. Economies of scale in combination with economies of scope have meant that in the last three decades very particular needs of individuals around the world can be met by global companies. A small number of individuals in each country combined form a large enough group to make a profitable market or have a strong voice as opinion leaders or trendsetters to make it interesting for larger corporations to produce for these niche markets (Anderson, 2008).

Professionalisation and consumer empowerment

To counter the trend of large multinationals dominating the market of customised goods, voices arose to support individual consumers by organising and protecting their interest. Consumer organizations protecting the right of the consumer and advocating market transparency came into existence during this same period (Vulkowich, 2002). In relation to the trends mentioned earlier there is thus a move towards **empowerment of the individual consumer, consumer rights and (industry and government) regulation** to protect the consumer from fraud and deception have all been stepped up in the second half of the 20th century which saw the frequent mentioning and flourishing of terms such as second opinion, ombudsman, etc (Burton 1994; Jacobs Kronenfeld, 2001; Von Tigerstrom, 1998). Besides protection against the increased power of large but legitimate businesses, there was also an increase need for protection against illegitimate schemes. Fraud and non-compliance (esp. in

international transactions) have all become easier and have a larger reach with interlinked global systems of commerce and trade (Grabosky & Russel, 1996)

In addition, consumers have become more conscious of the effect of consumption on the environment and other global issues, demanding more information about the origin and social responsibility of producers of good (Freestone & Mc Goldrick, 2008). Thus **consumption has become more global and more socially aware** through the professionalization and empowerment of consumers. In this context a relational view of market exchanges is important. Relational marketing (started with Berry, 1983) has become the dominant view of marketing since the eighties. It does not consider markets as made by one-shot exchanges between atomized individuals but as made by socially loaded relationships between consumers and vendors. This approach emphasizes the role of consumer-brand relationships (based on trust and affect), and the importance of consumer to consumer relationships (Word of mouth/viral phenomena and consumer communities).

2.3 Changing role of the consumers

The relationships between consumers and producers have changed in the last half decade as well as our idea of where and when consumption takes place. This has meant that the role of the consumer has changed. Personalisation and professionalization of consumption means that certain distinctions in the consumption process, eg. between consumers and producers and between commerce, entertainment and learning, are more difficult to make.

The blurring of the boundaries between consumption and production and the cult of the amateur

The continued integration of consumption into the domestic sphere means that individuals have started to appropriate the consumption process. Two trends can be observed since 1970. The first is the **commodification of consumption activities**. This idea comes from an interactionist and socio-cultural perspective, in particular the theory of extended self as proposed by Belk (1988), which explains consumption choices as role-playing in everyday interactions and symbolic construction of social life. From this perspective products shape the self (you are what you consume) both in the self-image of the consumer and in the eyes of those around them. In this approach the focus is on the symbolic but also the cultural and social level of consumption. The consumption experience is considered holistically, and all the components of the consumption events (before, during and after buying) are considered for their subjective contribution to consumer gratification (Firat & Venkatesh, 1995; Holbrook & Hirschman, 1982; Holt, 1997). This approach also focuses on the social and cultural components of consumption processes. Consumer communities and tribes are considered in their relationship with brands and brand meanings and activities which are not in origin linked to (functional) consumption can be made part of the consumption production process. Individuals make money of consumption processes in which they used to be the paying party by the added cultural or symbolic value that their 'community and tribe' related activities have. This can occur in direct interaction with producers through focus groups in which they evaluate and discuss products and experiences and through becoming 'opinion leaders' in their community, but also indirectly through the value their presence in certain contexts and events has to advertisers. Their free consumption of certain emotional products is made possible by the money advertisers pay to reach this audience, making the consumer a fundamental part of the production process.

In addition, **consumers are said to often be producers of content at the same time as consuming content**. Co-creation and crowd sourcing are two phenomena that are very important and challenge the traditional ways in which thinking about production and innovation in businesses takes place. This type of innovation in production is outside of the scope of this domain report which focuses on consumption but Kozinets et al (2008) would be a good place to start for a further exploration of the changes in the production process. Producers are asking for consumer or amateur input in their design and sales process.

Focus groups, design your own and easy/cheap distribution of home produced products has led according to some to a blurring of consumer/producer boundaries. Consumers ask for goods tailored to their needs and this often means they want a greater say in the production process.

The blurring of the boundaries between commerce, entertainment and learning

The latter half of the 20th century has also seen a continued **blurring between consumption, entertainment and learning**. There has been a move towards experiential consumption in so-called postmodern markets, which coexists besides or has taken over more rational exchanges of optimizing market actors. This perspective recognises that "... consumers are feelers as well as thinkers and doers; the significance of symbolism in consumption; the consumer's need for fun and pleasure; the roles of consumers, beyond the act of purchase, in product usage as well as brand choice, and so forth" (Addis & Holbrook, 2001, p. 50). There are two research approaches to this issue of the experiential consumption.

The first one works within the framework of the individual-level psychological approach to attitude studies and consumer behaviour. It explains the different types of consumption in terms of different types of needs (utilitarian or hedonic, Solomon, 2006), in terms of different hierarchies of the cognition, affect, and behaviour chains of effects (Zajonc, 1980; Petty & Cacioppo, 1986; Solomon, 2006) and in terms of different levels of consumer involvement with the products they buy (Mitchell, 1979). Terms such as product placement, infotainment and more recently advergaming are all part of this trend towards experiential consumption (Kretchmer, 2004, Winkler, 2006). This is the new value-based idea of advertising, the idea that advertising can be more effective if it offers value to consumers (Mandelli, 2005). The products in this process are part of a broader context in which the experience of using them or of interacting with them is integrated into everyday life and activity. They form part of the construction of the meaning and interpretation of different activities and the people we interact with.

In these contexts advertising and entertainment and learning are often brought together which makes understanding consumption as separate from other types of mediated interaction problematic. The academic world has emphasised critical consumer and media literacy as necessary skills to understand producer intention on platforms that combine these different elements (Buckingham, 2007, 2008; Livingstone, 2003).

3 Applications of ICT in Consumption

It is difficult to separate the social trends discussed in the previous section from technological and information and communication technology trends that have taken place alongside these social changes. Production in the 20th century was strongly linked to industrialization which in turn was based on technological developments, the **latter half of the 20th century and in particular the last two decades were marked by a move away from heavy industrial production to a society labelled "information society"**. Instead of mechanics, bits and bites have become what makes the world go round - and these bits and bites are based in Information and Communication Technologies (ICTs). Three areas have seen the most discussion of the impact of ICTs, this is the idea that new ICTs have substituted or supplemented older media and forms of interaction. The second is how ICTs have changed the significance of place and time in consumption and the rise of interactivity in consumption processes. All these ICT developments are related to the trends described in section 2.

3.1 Substitution and supplementation (of media and producers)

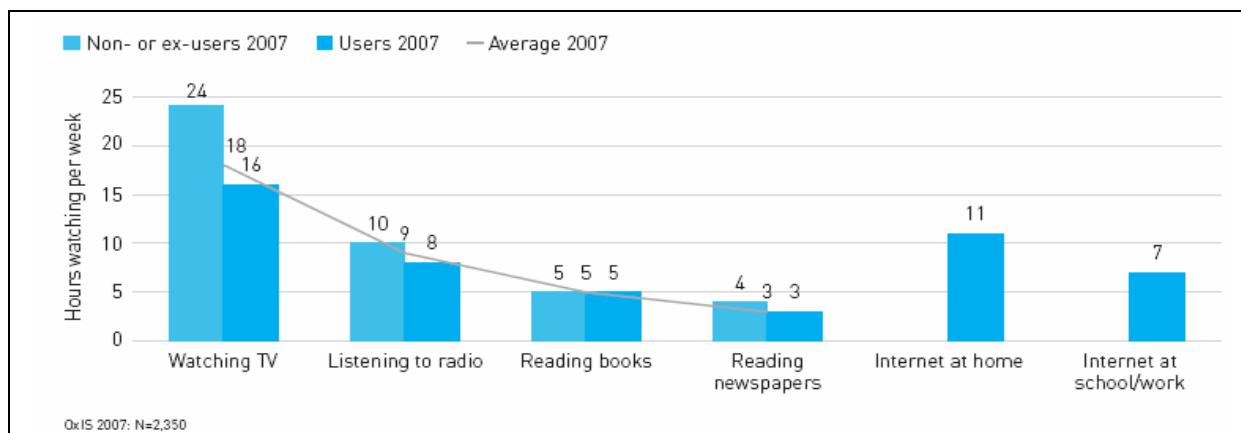
A question that is often asked in relation to any kind of social behaviour is whether the rise of new technologies reconfigures how we do things and what we do (Dutton, 2004). This is

strongly related to the debates of **substitution and supplementation**. In the area of emotional consumption this centres on whether new media replace old media for consumption and interaction. In the area of instrumental consumption this often focuses on how we access goods, that is, whether we are replacing the old intermediary with a new one. The discussion may have started with the telephone which made it possible for people to get entertainment and product information from a wider range of suppliers perhaps diminishing the importance of the local corner shop. Many new ICTs have come into the consumption arena since then and every time a new one is introduced the debate of substitution and supplementation flares up.

Old versus new media

The use of new ICTs like the Internet follows many of the same patterns as other more traditional media. Important in the impact that the introduction of new ICTs might have is that they change the way in which we interact with others whether these are individuals or organisations (Dutton et al., 2007). This will thus also influence our consumption habits. There are two arguments in this discussion about how new ICTs are introduced in the interaction between producers and consumers of entertainment / emotional products. The first is that traditional media are replaced by these new ICTs, for example, there is evidence that **people who use the Internet tend to watch less television**³ which impacts the way people are exposed to advertising and awareness campaigns and the way in which people consume entertainment and information (Owen, 1999). Slogans such as 'video killed the radio star' and 'the death of cinema: movies on demand' exemplify this type of thinking. The Internet was also early on 'accused' of replacing other types of consumption, the end of the shop, paper and television have all been predicted when the Internet first appeared as an interactive multi-platform medium (DiMaggio et al., 2001).

Figure 2: Number of hours consuming different media by users and non-users in the UK, 2007



Source: Dutton & Helsper (2007)

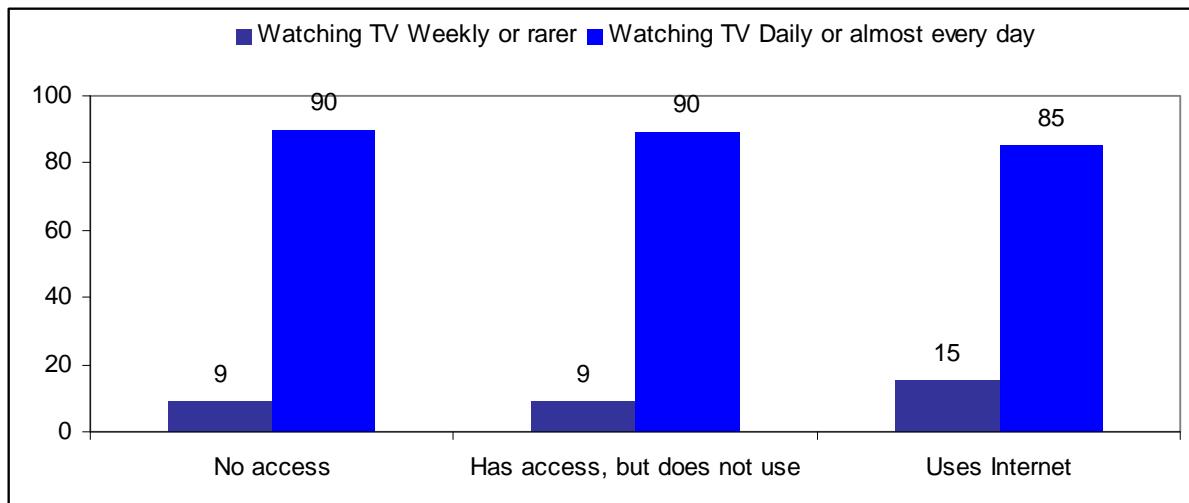
The second argument is that **new ICTs fulfil functions that cannot be filled by traditional media and that they exist alongside each other** satisfying different needs (Athaus & Tewksbury, 2000). There is evidence for both substitution and supplementation, new ICTs play a role alongside and as a replacement of traditional media. This is important partly because the big entertainment industries which sell emotional products to consumers are not always in control of the sales channels available on new ICTs and consumers have been

³ Television in this context refers to the service of television, rather than the screen as a device. Screen time has increased, and some television content has moved from the television screen onto the computer screen via video sharing sites, legal or otherwise, and services such as the BBC iPlayer.

very willing to share the products that they have acquired earlier with others through peer-to-peer, file sharing sites.

In general, the historical trend seems to favour supplementation and not substitution. Only recently has something akin to substitution been observed in the US (Digital Futures report), where Internet users watched less television than those who did not use the Internet. The same can be observed in the Eurobarometer 241.

Figure 3: Television viewing and access to the Internet, 2008



Data source: Flash Eurobarometer 241

Figure 3 shows that in 2009, amongst those who use the Internet a larger proportion watches TV less than once per week than in the group of ex- or non-users of the Internet.

Nevertheless, further analysis of the Eurobarometer 241 showed that this effect disappears once differences in age, education and income have been controlled for. In other words, the **difference between users and non-users in television viewing is mostly explained by socio-demographic differences** between the two groups and not by their Internet use or non-use (see Table 23 in Eurobarometer report).

Of course, the availability of materials through ICTs and the ease of distribution have worried producers of content when consumer prices drop or even disappear because of this. There is certainly **evidence that people use new technologies to easily access and collect emotional products**. Almost half (49%, Eurobarometer 241) of European Internet users have used the Internet to download or listen to music which indicates that it is relatively popular amongst users, even if it is less popular than general online shopping.

The WIP surveys shows that nevertheless the **use of new media for emotional consumption over time is more evolutionary (ie. gradual) than revolutionary**. In the UK, for example, entertainment related activities increased only marginally, downloading music increased by only 5 percentage points since 2005, so that around 60% of the Internet users downloaded music in 2009. Downloading videos in the same country has remained low at an unchanged one third of Internet users. Interesting is that even the rise of YouTube has not increased the watching or downloading of videos notably.

There is thus little evidence that the trend over time is for new media to replace the old media once they have been introduced. Clearly these trends might change when we look at this over longer time periods, but the WIP data suggest that after an initial exponential increase in use of new media when they are just introduced for 'old media purposes', the use curve quickly flattens off as it reaches saturation, perhaps until a new application comes along that enhances the experience.

Death of the traditional intermediary?

One important aspect of the consumption process from producers to consumers is the intermediary, the person who sells the goods of the producer to the consumer. ICTs, and especially the Internet, seem to have had the largest impact here in comparison to other consumption practices. Price comparison websites (eg.moneysupermarket.com, Confused.com), online travel websites (e.g. Opodo.com, Travelocity.com, Lastminute.com) and consumer to consumer sales platforms (e.g. eBay.com) have all been forecast as leading to the death of the traditional intermediary. The **expectation has been that market power, based on the preference of the consumer for self-service, would shift from suppliers and intermediaries to consumers.** Instant, 24 hour access to sales platforms through the Internet is said to have undermined the dominance of large entertainment conglomerates in the music and movie industry. The possibility of selling products without the traditional intermediaries could make agents obsolete since artists and entertainers have direct access to their market and cheap production lines. In addition, the **exchange of products between consumers has been facilitated by the rise of peer to peer file sharing websites** (e.g. BitTorrent). There are of course **legal issues here as regards copyright and ownership.** Nevertheless, the original disintermediation hypothesis has been disconfirmed by evidence and almost abandoned. There is more **consistent evidence for re-intermediation and explosion of intermediation points in digital markets** (Anderson & Anderson, 2002; Luo & Donthu, 2007; Del Aguila Obra et al., 2007).

Another issue is the changing role of expert intermediaries in consumption of products. The rapid changes in the Internet mean that it is not clear to many consumers yet who the trusted expert intermediaries might be and where people can go to find their way through a range of different producers and safety certificates to trustworthy sources. This might influence long term psychological, physical or economic wellbeing. If this uncertainty remains, people especially vulnerable groups might be taken advantage off or encounter fraudulent producers of goods. Critical media literacy is sometimes seen as a solution to this, as it emphasises creating critical consumers who are able to judge the reliability or a source without relying on expert advice (Ofcom 2009). The medical industry was one of the first to offer direct-to-consumer services and there have been concerns about the disappearance of the intermediary here (see Health domain chapter).

An important aspect in this area the rise of consumer self-service technologies (Voß & Rieder, 2005). Meuter et al. (2000) define these as 'a wide range of technologies, including the Internet, to allow customers to produce and consume services electronically without direct contact from firm employees.' (p. 899). At the same time the amount and variety of technologies and content delivered through these technologies is increasing rapidly. **The production of media content is shifting from a scarcity-based "filter then publish" paradigm to a "publish then filter" mode,** and the filtering function is often left to the consumers. This development requires a professionalisation of the consumer who needs to be an expert ICT user and have enough knowledge in the area to be an effective searcher and user of these types of services (Dabholkar, 1996).

3.2 Time and place

The ease of accessibility to products discussed in section 3.1 related to the substitution, supplementation discussion is also directly linked to another issue in relation to consumption and ICTs. This issue is the effect of this ease of access on transaction costs, a fundamental part of any type of consumption and on the location and mobility of consumption. This section discusses these three issues in more detail.

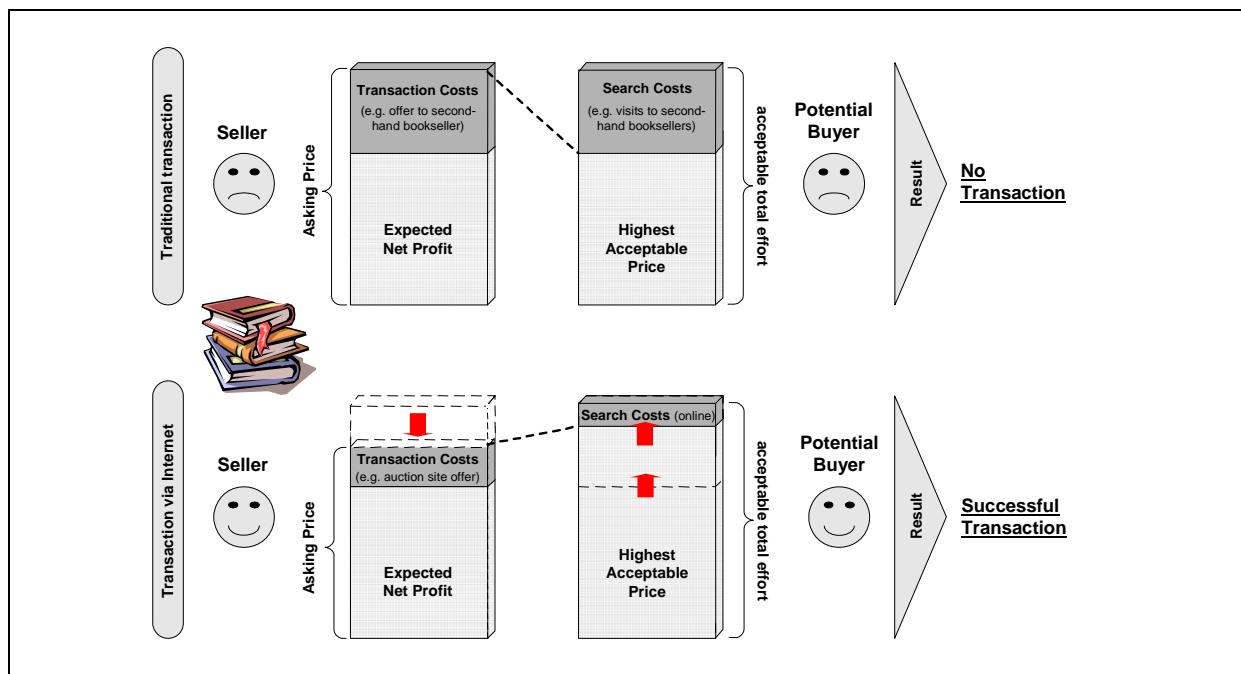
Costs of transactions

The Internet, together with other ICTs, has made a big impact on the **ease and flexibility with which consumption can be carried out.** The basic underlying reason can be found in

transaction cost theory. Transaction cost theory was originally developed to explain the existence and boundaries of business enterprises. It suggests that there are marked differences in the costs of executing transactions inside of organisation as opposed to on the market. This leads to the theoretical finding that profit-maximising companies execute those transactions internally that would cost more to conduct through market contracts. As was noted by the early transaction cost theorists, transaction costs can be altered by technological progress. The expectation with ICTs that allows for consumer self-service was that costs would fall as a result of e-Commerce. ICTs in general, and the Internet, in particular, have been shown to reduce the costs of many types of transactions (Picot et al. 2003). An important component of the transaction costs that are incurred by activities for acquiring information are search costs. These arise when market participants have to invest in activities to find the information they need to decide how to behave on the market, e.g. to take part in the labour market or stay out. Search costs are determined by the nature, number and intensity of search activities, but also by the technique and technology used for investigating information. For this reason, ICTs are said to have a major influence on search costs, not only on their overall level, but also on their composition and the relative costs of different search techniques. The assumption that ICT lowers transaction cost is a producer-centric perspective and does not include the new transaction costs consumers are facing. Instead of a lowering of transaction costs it would be more appropriate to talk about a shift in transaction costs.

The Internet has enabled the emergence of new markets which have not been sustainable before, because transaction costs were prohibitive (see Figure 4) – a typical example of market failure which the Internet and other ICTs were able to abolish. By decreasing transactions costs (here: the costs for identifying a person interested in buying a used book on the one side, and the cost for finding a copy of a sought after book on the second hand market on the other side), Internet platforms such as eBay have created markets which ultimately lead to everybody being better off – with the possible exception of intermediaries who cashed in on the lack of market transparency in the situation before.

Figure 4: Emergence of new markets enabled by Internet related decreases in transaction costs



Source: Gareis et al. (2000)

While **consumers enjoy lower transaction costs for shipping and processing of eCommerce** and the additional advantage of 24h consumption, which does no longer depend on the opening times of shops, they also **face new transaction costs for finding**

and selecting products and sellers, enquiring about the quality of the goods and services, and determining which offer to trust.

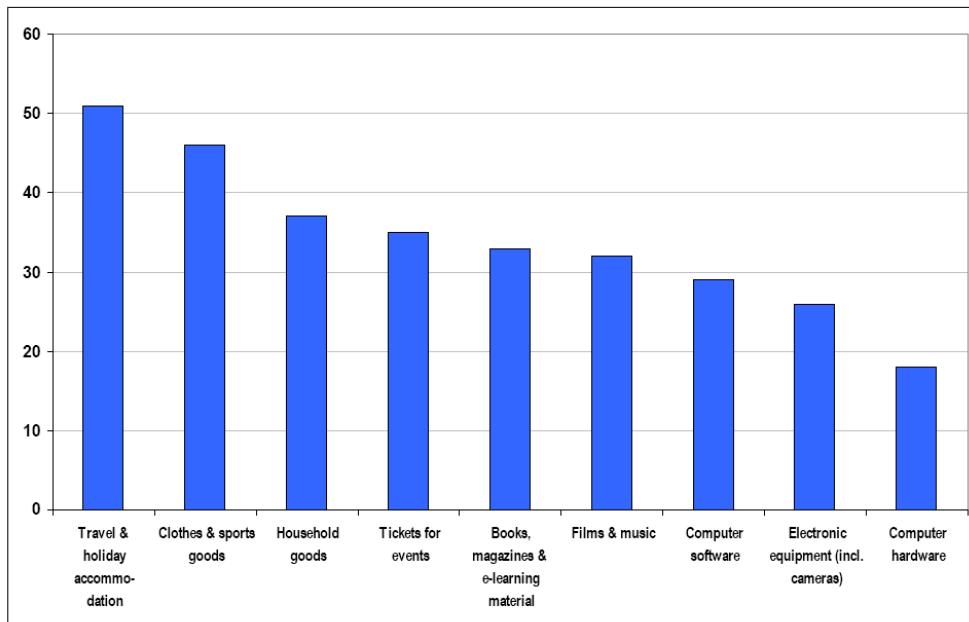
Hence in terms of individual's perceptions consumers are not undecidedly positive about the costs and benefits of the eCommerce. Only half (50%) of European Internet users thought in 2009 that the Internet has a positive impact on their shopping experiences, the only other social capital activities that had more negative responses were dealing with local authorities and meeting new people (Figure 6, Eurobarometer report). Individuals evaluated the influence of the Internet on culture, ie. emotional consumption, more positively, 70% said that the Internet had had a positive impact on this domain. While the questions are not completely comparable due to the more open nature of the culture question, this is some indication that in the eyes of the consumer the **Internet may have had a somewhat more clearly positive effect on cultural than on instrumental consumption capital**.

Domestication

Important besides time saving, is the possibility of ICTs to change our conception of consumer space. In theory it is now just as easy to buy something from a shop in the US or China as it is to buy something from the corner store. Home delivery of everyday goods such as groceries, books and clothes can take place anytime and anywhere (especially with the rise of mobile broadband technologies). One argument is that this leads to the "homebasedness" of consumption, that is the consumption and entertainment process is moving more and more to the private sphere of the home where people can now get personalised products delivered to their doorstep (see Figure 5). **ICTs as platforms for home entertainment and consumption have become more and more part of our home based, private everyday lives** (Silverstone & Haddon 1996). ICTs have thus made it possible to move away from the hustle and bustle of the 'real life' high street and shopping mall. This trend towards domestication was extensively discussed in section 2.1 and will thus not be further elaborated upon here.

Figure 5: Goods and services purchased online, 2009

Figure 7: Types of goods and services bought or ordered over the internet for private use, EU-27, 2009 (as % of individuals who bought or ordered over the internet in the last 12 months)



Source: Eurostat ([isoc_ec_ibuy](#))

Source: Eurostat Data in Focus, 46/2009: 5

Mobilisation

However, there is also a trend towards the opposite, referring back to the supplementation/substitution hypotheses. At the same time as becoming more domesticated or privatised, **consumption has become more flexible and mobile where ICTs make it possible for consumption to take place in a variety of settings not limited to traditional locals** of consumption. The Eurobarometer 241 shows this in the trend towards consumption activities in the office, as 23% look for travel information and 12% undertake ecommerce activities at work (Figure 34 in Eurobarometer report).

Nevertheless, instead of replacing outdoor shopping, virtual or digital shopping can supplement or facilitate traditional high street shopping. This means that people will take their mobile devices and 24-hour comparison sites with them when they go shopping (Siao & Shen 2003; Yang, Sheng & Dia, 2008). There are numerous anecdotes that people tell illustrating this mobilisation of consumption phenomena, eg. people talking on their mobile phones in supermarkets inquiring about what the family needs for dinner that evening or blackberry users figuring out if the price in the shop they are in is really the lowest by quickly looking up the price somewhere else. It is unlikely that the touch and feel and smell of 'real life' shopping will be completely replaced, supplementation in some areas (clothes and food shopping) and substitution in others (eg. trip, music and book buying) will occur in tandem.

The **use of mobile phones to engage in commercial transactions** ("mCommerce") has constantly been predicted as the next big wave to transform consumers' experience (Kehoe 2000). Europe was supposed to take a leading role in the development of mCommerce. mCommerce includes applications like the use of the mobile phone to pay for bills or tickets ("mobile ticketing"), the consumption of digital media on the way, and location-based services. Despite the bullish predictions, Despite the bullish predictions **mCommerce has had little effect on the average consumer so far**. Current mobile payment services are too complicated to use and require opening an account before making the first payment, remembering cryptic password, or registering the telephone number with the service (Tan, 2004). Premium rate text messages have found acceptance, e.g. to pay for parking tickets or to vote during UK's Big Brother Reality-TV show. These success cases indicate that consumers are in principle ready to use mobile payments if the services are convenient enough to use. A recent 2008 study from Germany showed that 75% of Germans are not interested in mCommerce. 68% have never used their mobile phone to pay a bill and only 16% declared that they would use their mobile device for making payments at least once a week (Goldhammer, 2008). Consumers in the UK and France were found to be less prepared to use their mobile phones to make payments (Lightspeed Research, 2008).

3.3 Interactivity

Many of the developments in relation to ICT and consumption revolve around offering new platforms for traditional types of consumption, that is reconfiguring access in the sense of how we access information. Recent developments in ICT might suggest that there are more fundamental changes, not only in how consumers (passively) access consumption opportunities but also in what type of consumption activities we undertake. Interactivity in the latest ICTs is seen by some as a true revolution in consumption, empowering consumers, putting them in control of the production process, and, the flipside, increased monitoring of consumption activities. The impact of interactivity on these three areas is discussed in this section.

Consumer empowerment

An important and perhaps unforeseen effect of the introduction of the Internet was its **capacity to bring consumers together in the production process through the increase of interactivity** in what used to be broadcast (ie. one way) consumption messages from producers through mass media. Websites where feedback from the consumer to the

producer is possible in Direct-to-Consumer contexts is one of the areas that can be directly linked to consumer empowerment. Niche markets of consumers with very particular consumption preferences have joined in discussion boards and on product specific websites to comment on products and vendors (McWilliam, & O'Guinn, 2000). These so called Virtual Brand Communities are generally positive in nature in their evaluation of the product, but there are other sites on social networking platforms such as Facebook which evaluate brands in a more negative manner. Some of these are consumer generated and others are marketer generated. Even on the marketer generated sites consumers feel that they own the site and the product discussed on these (Cova et al., 2006). Producers see these sites as good opportunities to build brand awareness and brand loyalty (Kozinets, 1999, Muniz et al., 2001)

In the entertainment industry the fanzines and websites dedicated to specific programs, bands, shows, have supplemented the existing professional critics' evaluation in more mainstream media. The cult of the amateur coined by Keen (2007) has placed power in the hand of the consumer of both emotional and instrumental products. Evaluations are available to all and professional or official representatives of consumer groups have seen their role diminished in consumer protection issues. If a consumer is unhappy they cannot only feed this back directly to the producer but also to all potential future products.

The rise of the prosumer/co-creator

The easy access to selling and buying platforms and the interaction between consumers or peers has also led to a phenomenon in which the **boundary between consumers and producers has become smaller**. That is, it has become easier for consumers to sell as well as passively consume, the term that has been used to describe this phenomenon strongly linked to the rise of interactivity in ICTs is the 'prosumer' (Kotler, 1986). While earlier trends existed in this area, mainly in the form of the personalization and customization of services and in the traditional classified adverts, the market for prosumers or co-creators as Kozinets et al (2008) labelled them, is now potentially much larger. Small producers sell directly to consumers who at the same time are likely to have sold products themselves, the rise of auction sites, such as ebay.com, have supported this trend. While e-bay in its original design was not specifically for prosumer activities as it was targeted for used goods to be sold person-to-person, in practice it has become a market for small-scale traders who buy, sell, re-sell, and re-market goods in a way that comes closer to the idea of the prosumer. In the UK in 2009, a considerable number of Internet users had sold something online themselves, this is not universally popular countries across Europe however (World Internet Project data, 2009).

There is some indication that these consumer-to-consumer auction environments are more and more professionalized with small businesses and larger producers selling their products on these sites, taking advantage of the dynamic pricing possibilities of the sites. In 2006, more than half of the transactions on eBay in the US were conducted by professional sellers (Kashkooli, 2006). eBay estimated in 2006 that around 70,000 people in Britain make a quarter or more of their income by selling on eBay and that 170,000 small businesses in Europe depend on it for a significant chunk of their income (Gibson, 2006). Supply and demand can be closely managed on these sites and prices varied accordingly, this is true for amateur consumer/producers as well as the traditional producers.

In the emotional or entertainment products corners amateurs who have created their own artistic product have potential access to a global market without the need for the traditional agents and studios that might in the past have marketed and sold their product (See creation domain chapter).

Registration of behaviour and needs

Another important element in the range of opportunities that interactivity offers is that this allows not only a closer watch of the consumer over the producers' background and actions, but also the reverse. Most product and services websites and consumption in general seems to require an **ever-increasing amount of information about the consumer**. The consumer's behavior is registered and there preferences noted, all this facilitated by ICTs with data mining and database combining powers that have slowly build up over the last decades (Dickie, 2006). **Privacy and data protection watchdogs have been concerned** about this. When these powerful data gathering tools first became available producers seemed to suffer from a 'we do it because we can' phenomena where all kinds of information were gathered without a clear purpose and a type of 'consumer information overload' on the part of the producers can be observed (Ebner et al., 2002).

However, many direct-to-consumer websites have figured out ways to gather data with or without the (conscious) permission of the consumer to tailor the product websites to the consumer needs. Good examples of these are websites like Amazon where based on past purchases and purchase patterns by other consumers the client/buyer gets recommendations. Grocery shopping online follows the same techniques where customer loyalty (ie. Returning to the same service) is rewarded with an intelligent shopping cart that remembers what has been bought before, seasonal suggestions and announcements of offers that, based on analysis of consumer behaviour, are likely to be of value to the customer. While most consumers worry about the amount of information that is available about them online (Dutton & Helsper, 2007) and the information that various organizations and companies are selecting, the reality is that to be able to reap the benefits (ie. Discounts, pre-sales etc) from online consumption it is necessary to sign up and give away personal information. The limits of what consumers are willing to give up to get a tailor-made product are still unclear.

4 Social Impacts Analysis

The ICTs, in particular interactive Internet applications and large databases which have been mentioned in the previous section rolled out over a few decades and it has only recently become clear(er) who the winners and the losers might be when ICTs and consumption come together. It would be wrong to argue that everything changed dramatically the day the Internet came into the consumers' lives. **Most of the changes in consumption patterns have been evolutionary rather than revolutionary.**

This section discusses the social impacts of ICTs in the area of consumption the barriers that the uptake of ICTs for consumption has encountered in the last decades as well as those factors that facilitated and enabled the use of ICTs in consumption. It is of course difficult to disentangle the rise of ICT in relation to the more general trends in consumption from the effects that ICTs have had in changing consumption, most data that is available is survey or observation based and cause and effect between social trends and the introduction of ICTs is therefore hard to establish.

4.1 Rationalisation

ICTs enable the transfer of all types of data over distances, which together with the trend towards informatisation of economic activity and digitisation of products and services means that it becomes increasingly possible to substitute the flow of data in networks for physical transport. Because physical transport is expensive and burdensome, distance has always exerted a strong influence on the types and levels of activities people carry out at a given place. Electronic transfer of data has the special characteristic that **marginal costs for the transport of a unit of information, once the basic infrastructure**

is in place, are very small. This means that many activities that used to require physical transport, but can now be carried out with the help of electronic data flows, have become cheaper. In practice the distance-shrinking character of ICTs mean that more and more of everyday activities can now be carried out electronically from anywhere at the click of a mouse. This has opened up a whole range of new possibilities for people whose ability to take care of personal business and transactions used to be constrained – for example because of lack of time, because of individual functional restrictions, or because of geographical location in a peripheral or otherwise disadvantaged region of Europe. This section discusses the impact of this rationalization on the consumption of emotional and instrumental products and how this process can be related to the domestication of consumption.

Emotional products

The arrival of social networking sites, such as Facebook, virtual worlds, such as Second Life, and the increase of the number of users and producers of content makes it possible to consume emotional products (ie. entertainment) from ‘the couch’. A very considerable part of this type of emotional consumption is now said to be taking place in the home due to the increase in broadband diffusion. There is little empirical evidence however that ICTs have changed our behaviours significantly in this area in terms of what we do (see section 3.1 on substitution/supplementation). However, there is agreement that **ICTs have made home consumption more efficient and has lowered transaction costs considerably** (Dutton, Helsper & Gerber, 2009).

Nevertheless, the improvements in data storage capacity mean that there is increasingly also the possibility to mobilise consumption outside the home into traditional sites of consumption. A few concrete examples of this type of developments in the rationalisation of consumption of emotional products through ICTs are:

- 24-hour home entertainment sites (eg. BBC iPlayer, BitTorrent, YouTube, TV on demand) whose use has been very popular from the day they launched and many attribute this to the low transaction cost and high usability, low barrier accessibility of these websites. Some of these offer high-end productions from traditional broadcasters and producers, other sites are made to give people the opportunity to download, look at and listen to material that is less high end amateur produced material that they would otherwise not have had access to in the home.
- Virtual worlds (eg. Second Life) has brought the possibility of role-play and all other types of consumption into a virtual realm. Consumers can literally sit at home but with the world at their fingertip. Nevertheless, in terms of rationalisation, there are not many people who have sufficient capacity on their personal PCs and laptops to run these virtual worlds and the consumption experience of virtual concerts, movie launches and other leisure activities are therefore still the realm of the few.
- Online gaming such as World of Warcraft have placed traditional role playing games, board games and more recently offline computer games offer an entertainment experience directly into the home. Since most of these are interactive and can involve players from all parts of the world they offer both mobility as well as domestication.

All these have developed their own (virtual) economies and markets where products are bought and sold using tokens or even gift economies that are not necessarily of value in the ‘real world’ economy. These have value in the virtual world, which is accessed in the person’s domestic context in terms of emotional and personal value (ie. happiness and confidence).

Instrumental consumption

Instrumental consumption through ICTs in the private domain include transactions such as online banking, online ordering and reservations, as well as many e-government applications.

One of the more fascinating effects of the Internet has been the evolution of online trading and selling between private households through the Internet, mainly by means of online auctions. The Oxford Internet Surveys show that amongst UK Internet users eCommerce has been one of the most popular uses for over four years (see Dutton & Helsper, 2007). This is an area in which the transaction costs have clearly dropped also through the rise of micro-payments through services such as Paypal (Savoie & Raisinghan, 1999).

Figure 6: Percentage of UK Internet users that have used eCommerce applications, 2007

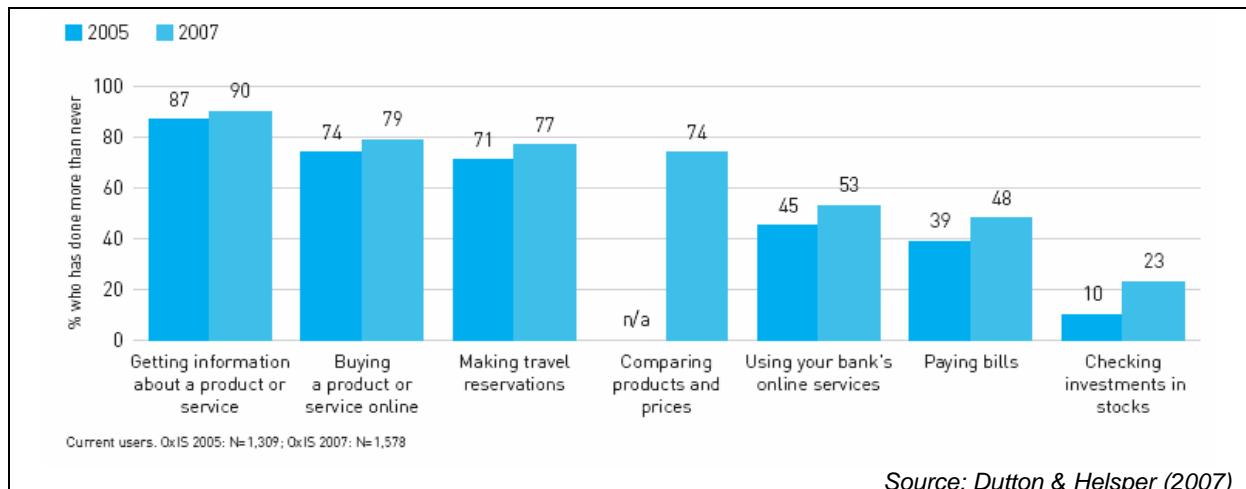
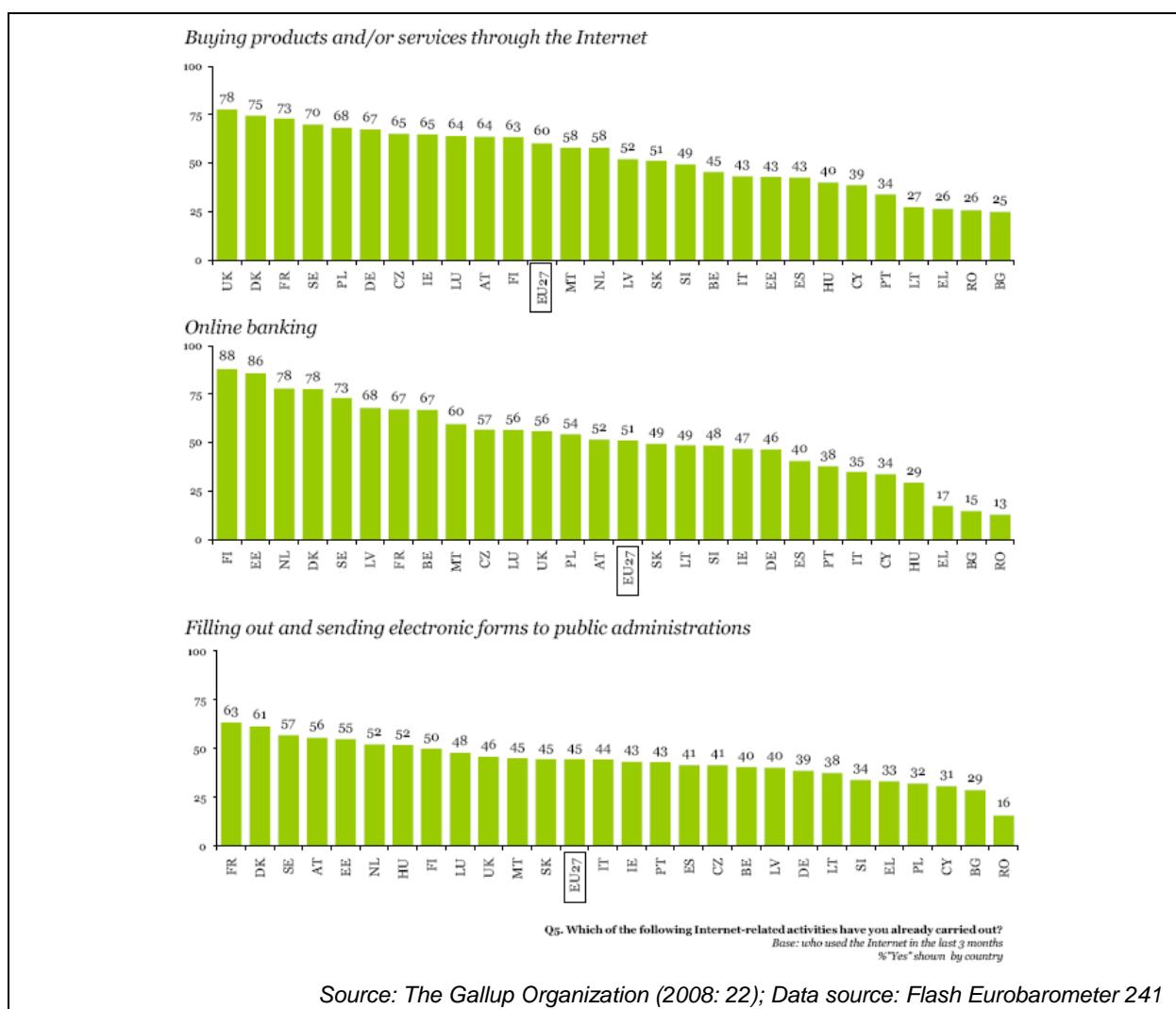


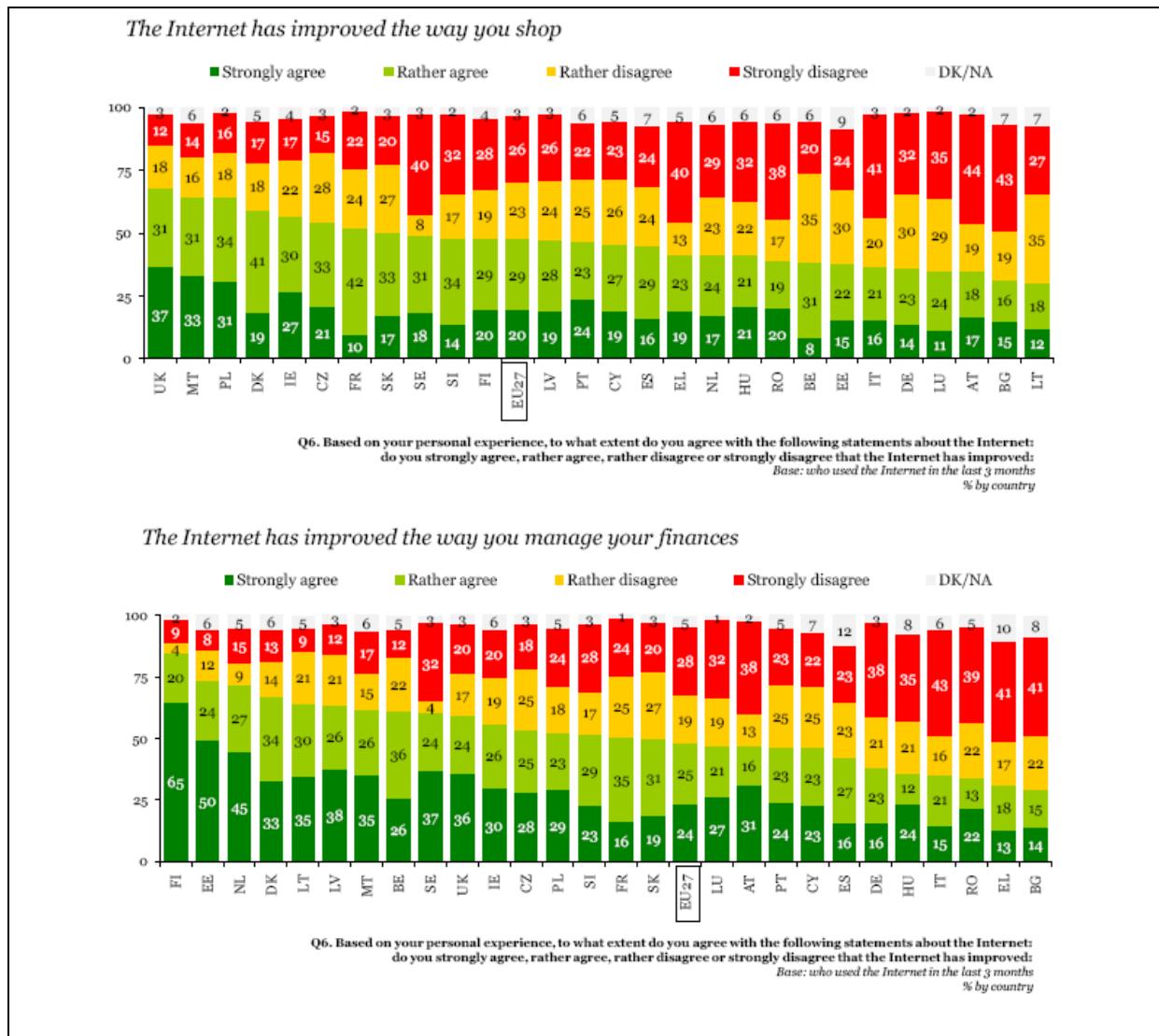
Figure 7: Buying products, using banking, and sending forms via the Internet, 2008



A few concrete examples of these types of developments in the rationalisation of consumption of instrumental products through ICTs are:

- **Price comparison** sites such as Travelsupermarket.com, Travelocity and Moneysupermarket.com offer the possibility for instant comparison of a wide range of different product following a more transparent process than was the case in traditional face to face advice. The consumer does not depend on what is available in a certain shop but can compare what is available beyond their local offers and even check whether in other countries offers are more advantageous. These types of sites are amongst the most popular uses of the Internet in general (Dutton, Helsper & Gerber, 2009).
- **Online payments** through offline banks' systems, but also through third party payment systems such as Paypal, is relatively wide spread across Europe. It allows for transactions without the need for physical currencies and gives the person the opportunity to control accounts and transactions almost instantly. It has sped up bill paying as well as interpersonal transactions. Even if it has brought concern regarding the facilitation of fraud and access to personal banking details.
- **Home shopping** and (second hand/classified) sales on sites such as eBay.com, Craigslist, Amazon, Bol and the websites of traditional offline companies have further sped up and facilitated the consumption experience. Consumers are able to keep records, often track their purchases and have their payments details saved to the sites. All these lower transaction costs for the consumer, domesticate consumption and make the shopping experience more efficient.
- It should be noted that the vast majority of the new intermediaries are of US-American provenance, including eBay, Craigslist, Amazon, Travelocity, Paypal, Facebook, and Second Life. They operate localised services in several European countries and provide consumers with an adjusted consumption experience. The market for intermediaries in Europe is slow to emerge – with the notable exception of online travel agencies like opodo.de, (Germany) or lastminute.com (UK). The European market entry strategies of the US-based companies focus on the larger European countries and consumers in the smaller European countries experience significant delays before being served by the global intermediaries. Attempts to "take over" an intermediary, e.g. the acquisition of US file-sharing service Napster by Germany's Bertelsmann, have frequently not been successful. The reasons for these failures deserve further investigation, but are outside the scope of this report.

While the lowering of transaction costs is important in consumption, it is definitely **not the case that consumption has moved completely to the more efficient (direct to the doorstep), domesticated types of consumption** described above. For emotional as well as instrumental consumption other factors beyond efficiency and low costs, such as emotional experience (Mitchell, 1979) and confidence in face-to-face settings (Dutton et al., 2003) for consumption remain important. Hoffman and Novak (2003) argue that consumption online depends on flow which they defined as "the state occurring during network navigation which is: (a) characterized by a seamless sequence of responses facilitated by machine interactivity, (b) intrinsically enjoyable,(c) accompanied by a loss of self-consciousness, and (d) self-reinforcing" (p. 4). They showed that this type of experience is easier to achieve for goal oriented (ie instrumental) consumption than it is for experiential consumption which might lead consumers to seek experiential consumption elsewhere.

Figure 8: Shopping and finances on the Internet, 2008

Source: The Gallup Organization (2008: 27, 33, 34); Data source: Flash Eurobarometer 241

This is evidenced by the fact that offline shopping has remained very popular. How important transaction costs and the rationalisation of the consumption process are depend on the type of product and the quality of the websites and the access that people have to ICTs such as the Internet.

Barrier: Transaction cost for consumers engaging in international transactions

While customers in theory can interact with business partners globally and engage in business transaction, this freedom is in practice **impeded by the transaction costs for shipping and customs regulation**. While commercial producers realize economies of scale which make global value chains attractive, the individual consumer does not only face significant commercial risk in dealing with unknown business partners from different jurisdictions, they also have to pay the fees for individual shipment and handle customs. intellectual property law, in particular trademark law, poses an additional threat for cross-border transactions.

Enabler: Easy access to the Internet (in Northern Europe) – drops in prices

The Internet has made a large difference to the **availability of information**. The cost of broadband and high quality mobile connections has dropped considerably which makes

accessing these ICTs more affordable for groups that would previously not had the economic resources to do access this type of information. Broadband has now become the dominant way of using the Internet in most high penetration countries (WIP, 2009; Dutton, Helsper & Gerber, 2009). Broadband is often considered fundamental to smooth online transaction.

Policy in many European countries that stimulates digital inclusion has helped the spread of access to ICTs. People equipped with the adequate skills in identifying, selecting and processing information enjoy the benefits of almost instant access to an incredible wealth of data on the Internet. As opposed to the pre-Internet era when most mediated information was transmitted through the mass media, the Internet enables high degrees of personalisation of information retrieval. The leaps in performance in search engine technology have made in recent years have provided users with easy access tools to exploit this richness of information.

Barrier: Digital and Socio-economic exclusion (incl Media/Advertising literacy)

As for any other area where services and interactions are moving to digital media such as the Internet, a **fundamental barrier is the relatively large proportion of people who are not able or choose not to engage with ICTs**. There is evidence that the introduction of ICTs can solidify or increase existing gaps in economic participation (Helsper, 2008). In Europe the percentage of Internet non-users ranges from, for example, 24% in Sweden to over 50% of the population in Hungary (World Internet Project, 2009). Since transaction costs are in general lower for buying on the Internet, the lack of access to the services that are offered online is a serious issue for full participation in society. However, in relation to transactions and interactions with producers (or prosumers) through ICTs other types of digital exclusion are important as well. Digital literacy, that is the skills to use, interpret and critically assess the intention of content produced through ICTs, is fundamental to a world in which consumption is completely free and equal (Selwyn, 2001).

The technical skills needed to operate ICTs often seem minimal to those who use these technologies extensively, but those who are new to this environment or who in general have no affinity with learning are at a great disadvantage when more and more products are sold cheaper or solely online and when the choice of goods over ICTs is greater than those in the offline world. Besides technical skills the importance of critical and interpretative skills has to be taken into consideration. Whenever things are sold, the consumer needs to evaluate whether the product is any good, whether it is useful (in an emotional or instrumental sense), and whether the price is right. Before the expansion of consumption through digital and mobile ICTs, media literacy was the general term used to describe these skills and, for the specific interpretation of sales messages, advertising literacy another.

The shift of media production to “First publish, then filter”, shifts the competence and burden to filter information to consumers. This shift poses new demands to the media literacy of consumers. The role of the intermediary changes from an information filter to an information access facilitator, and consumers have to negotiate continuously what to read, who to trust, and what information to believe.

The World Internet Project shows that in the UK people are fairly confident in their ability to critically evaluate online content and about their ability to create new content. However, Internet users were less confident about their technical and social skills in online environments (Dutton, Helsper & Gerber, 2009). Similarly the Eurobarometer 241 showed that in Europeans were not that concerned about information overload (see Eurobarometer report). Thus overall the conclusion could be that overall there is no worry in terms of media literacy, but confidence and actual skills do not necessarily match nor do we know how information overload affects consumption behaviour more in particular.

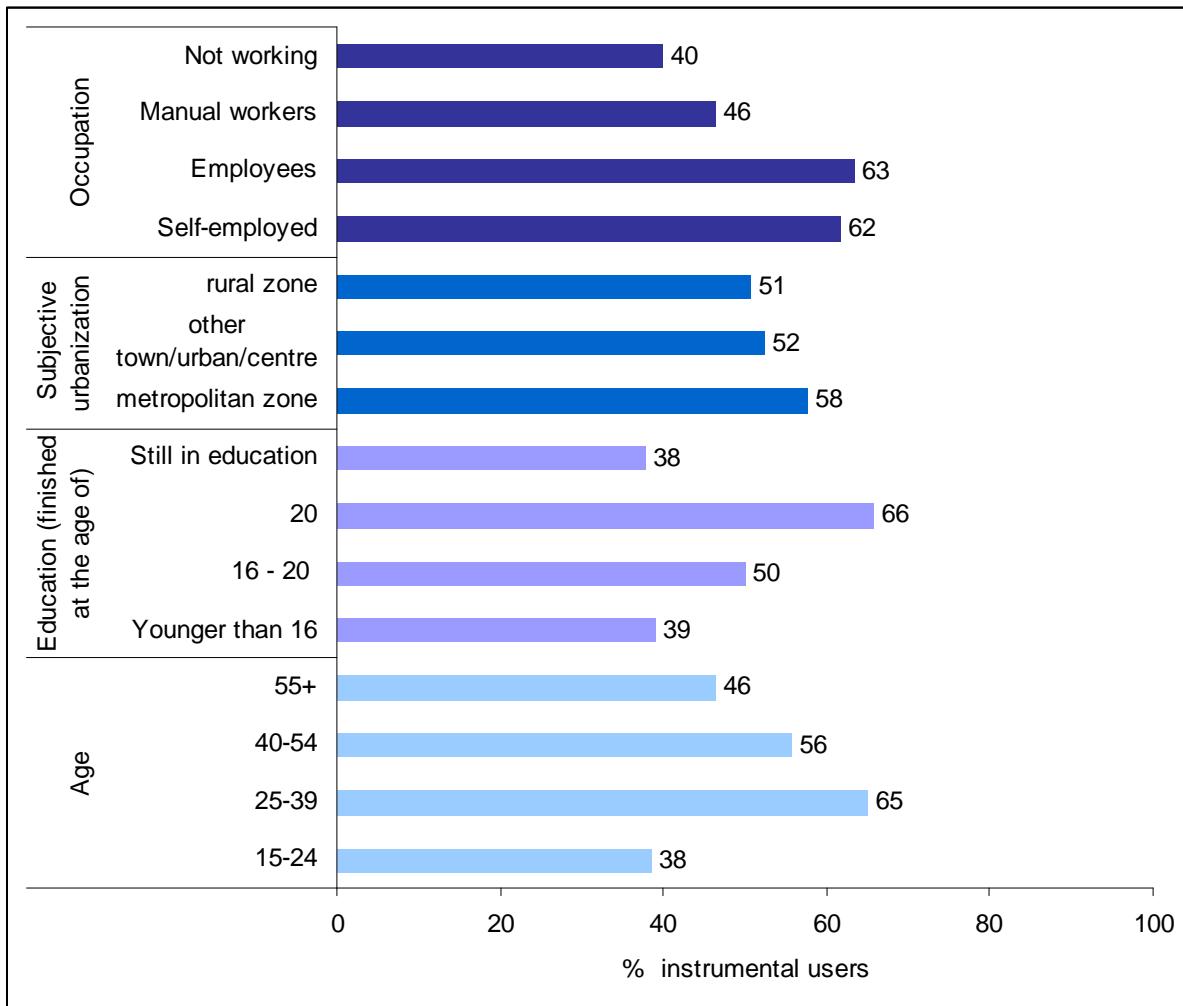
What we do know is that these types of **skills are unequally distributed in the population depending on age, socio-economic and educational levels and widespread access to ICTs will not necessarily overcome the skills barrier**. This is especially true because the

amount of information on the Internet and other interactive media is almost infinitely large and selection and interpretation are important skills to have in this environment.

With the increased need for more complex critical evaluations it is unlikely that socio-economic inequalities will diminish as we start to rely more and more on ICTs for consumption processes. We have to be cautious not to get overwhelmed by the promises of the consumption models. Instead we have to critically ask if consumption realities have changed for the mass of consumers or if only a tiny minority can actually make use of the new potential.

Similarly, **access does not relate to equality in use**. Online engagement in consumption is strongly related to offline socio-demographics characteristics. The Eurobarometer 241 shows clearly that for instrumental uses, which include the instrumental consumption activities discussed here there is still a number of digital divides across Europe.

Figure 9: Percentage of instrumental users in different socio-demographic categories, 2008



Data source: Flash Eurobarometer 241

Figure 9 shows that across Europe, instrumental users tend to come from (self-) employed, metropolitan, high education and young adult backgrounds. With the youngest and oldest age groups, the non-working individuals and rural areas the least likely to engage in instrumental uses. This indicates that socio-economic stratification is still a barrier to empowerment of consumers through the Internet.

4.2 Networking and Social Capital

There are signs of truly transformative practice in consumption. Online communities of practice are of particular importance in this regard. The experience of recent years gives credibility to the claim of Castells et al. (2004) who state that virtual communities of practice are an expression of the latent existence of common interests and/or values between people who do not know each other, but who could derive personal utility from interaction. Often participation in Virtual Brand Communities is more about social interaction than about the actual product. The rise of web 2.0 technologies and open source software have facilitated this type of collaboration which create information, products and services exchange through networks on relatively open platforms. Clearly interactivity and production through ICT are only available to those who have access to it and once access is achieved relatively high skill levels are needed for this type of participation. Investment is needed not only in being skilled or knowledgeable enough to participate in these networks, but also in relation to money and a gift economy which might not have direct benefits in the world outside the network. Concrete examples of these types of sites are Mailinglists, blogs and wikis around a whole variety of topics, for example, the winesociety, car society, celebrity gossip sites.

Enabler: Social networking sites and costumer feedback

The impact of web 2.0 on consumption if perhaps not yet measured in actual fact is clearly perceived to be positive by the consumers themselves. Internet users consult online information before purchasing an unknown product (Life Digitales Leven survey). Over a third of Internet users take advantage of web 2.0 applications to inform others about their experiences with sellers and buyers online. It was also consistently mentioned as Important in people's consumption in everyday (private) lives in the TRANSFORM study. In fact these aspects related to pre-purchase information were considered more important than many other aspects of the Internet in people's private lives. The importance of this is highly variable across countries, but the importance of the Internet in online finances and consumption according to the user is indisputable. Web 2.0 applications have made this kind of evaluation and interaction between consumers easier.

Barrier: Spam, Viruses and Spybots

Counter to this desire to interact, exchange evaluations and products is the fear that freely exchanging personal information with others on these types of sites also exposes people to risks of SPAM and viruses and spybots which can be hidden in the files exchanged. Some think that paid for or closed sites such as iTunes will counteract these negative aspects of social interaction based around consumption (Richter, 2008).

Social capital- empowerment of consumers

"Users have a tendency to twist new technology to fulfil their interests or desires", as Manuel Castells (2001) writes. The Internet, mobile telephony and the other new ICTs are certainly no exceptions in this regard. The latest developments in interactive, direct access ICTs have been used by consumers and producers to go beyond their original 'mandates ', that is consumers have become producers and producers are creating information and entertainment products that sell their instrumental or emotional products at the same time. Social ICT and Web 2.0 technologies have also given consumers unprecedented opportunities to join into communities of interest and give direct feedback on products and create new products in collaboration, which were previously the realm of experts. Beyond blurring boundaries between consumers and producers described in the previous section this has also meant a shift in the power balance in traditional consumption processes. Consumers have access to more information about producers and ICTs have facilitated the organisation of consumer groups on a national an international level. This refers to what Resnick (2005) called impersonal socio-technical capital. The interactions focus on

developing products, knowledge, goods or services and not on relationships as such. Therefore distinct to the networking described above that has a main interpersonal, social motive.

Concrete examples of sites where instrumental costumer interaction takes place:

- Enhanced interactivity through e-mail, embedded voice mail etc.;
- Product websites
- Consumer feedback forms
- Restaurant evaluation sites such as chowhound

The web 2.0 technology discussed earlier is a major enabler of consumer empowerment as well as of the possibility for consumers to become producers and the possibility of information, learning, consumption and entertainment to merge into one genre of technology use.

Enabler/barrier: Data collection and concentration of consumer data

One of the technical factors that has facilitated personalisation of consumption and the creation of niche markets is the exponential increase in server and memory capacity. Micro chips are now able to store a powerful computer processor on a surface as large as the tip of a needle. The prediction is that this trend is not about to stop. So far more or less consistently the capacity of digital resources (ie. memory, processing power) doubles every two years which is known as Moore's law (Schaller, 1997; see Roberts, 2000 for a critique). This has facilitated the storage and analysis of consumer data as well as an increase in the capacity of mobile devices. The iPod and PDAs are probably the most famous example in this arena. The latter is said to facilitate both the integration of ICTs into all household appliances (intelligent furniture, such a fridge that tells us when the milk runs out) as well as the mobilisation of ICTs that were largely home based (Internet computing).

This means that ICTs are now available to aid us with consumption whenever and wherever we are. Information is instantly accessible and so widespread that lack of detailed information about a producer or product makes it almost nonexistent in the world of consumption or at least suspicious and open to accusations of lack of transparencies. Consumers can get ever more information to make socially responsible or at least informed consumption decisions. Nevertheless, the opposite end of this is clearly the cognitive and time costs that more and more information requires. Information overload discussed elsewhere in this domain report is an important barrier to every increasing data collection, while consumers want more transparency and 'informed choice' is important for them it is not clear that consumers (or producers) now how to deal with these fast amounts of information (Howells, 2005; Iyengar & Lepper, 2000; Reibstein, 2002).

4.3 Empowerment and Participation

The ease of access to consumption spaces and products through ICTs also means that advertising messages are taken into an ever more personalised and privatised sphere, a space in which use and production of content are intertwined. Newer ICTs such as the Internet offer innovative ways of integrating entertainment, information and advertising and it seems that because of this all our actions and activities can now be commoditised (Rifkin, 2001). That is, our **everyday consumption, learning and production activities all have value in a world where large-scale producers are trying to reach an ever more dispersed and individualised consumer**. Gaming and online worlds seem to be the latest areas in which commercialisation has found its footing, also called advergaming (Marolf, 2007). This is accompanied by a diversification of platforms through which we interact with ICTs, consumers are involved in the creation of the products that they are consuming through, for example, interactive television (e.g. reality TV-voting). More recently Web 2.0

technology allows people to participate and create in constructing knowledge and products (see creativity section).

The consumption of information through the mass media remains one of the basic purposes of media consumption, including use of the Internet (Dutton et al., 2009). Having said that, the progressive convergence between previously separated media spheres, strongly influenced by the further development of the Internet, has made traditional distinctions, such as mass media vs individual/personal media, somewhat meaningless. Today, most experts observe a gradual shift towards what is called “meso-media” (Feldmann, & Zerdick, 2005), with **mass media becoming more personalised** (e.g. though increasing number of specialist channels, digital television with heightened interactivity) and personal media being opened up to larger numbers of the public (e.g. through online chats, discussion forums, blogging). Web 2.0 technologies and open source software have made the merging of consumers and producers easier.

In 2009, social networking in general and web 2.0 activities more in particular had gone up considerably in the UK indicating a shift in what was for long most common practice in relation to types of engagement with the Internet (Dutton et al., 2009).

Concrete examples of sites where consumption and production coincide are:

- **Create your own product sites** where large brand offer the opportunity to consumers to personalise their product. This is especially popular in the clothing section, Nike and others have applied this model to shoes.
- **Advertainment** offer game environments that are branded, contain advertising or direct gaming interaction with the product in a virtual world. Many children's brands have these types of worlds, Cadbury's chocolate, Coca Cola and other global companies are examples.
- **Social Networking Sites** where people are able to post their own products and get others to buy, comment or feedback on them. YouTube and Facebook are examples of websites where people create content to be consumed by others.
- **Classified sites** as discussed earlier are not only a platform on which traditional product are sold without an intermediary, but also platforms on which individuals sell their own creations. Ebay.com and Graig's list are obvious examples.
- **Open Source and Open Access collaborative sites** such as Wikis offer the direct opportunity to participate in the creation of content. Wikipedia is the most famous example, however, it is not clear how commercial benefit can be made out of these types of interactions since this idea goes against the spirit of these sites.
- Outside the realm of the Internet, but increasingly important is **Interactive TV**, where people through their voting or clicking on different aspects of traditional and newer entertainment products are involved in the production process deciding what gets published. Interactive television is in its relative infancy with the exception of reality television in which people vote for people to stay or vote. People are not yet convinced that the format works but some hope that the widespread introduction of digital television will increase its possibilities (Carmichael et al., 2006).

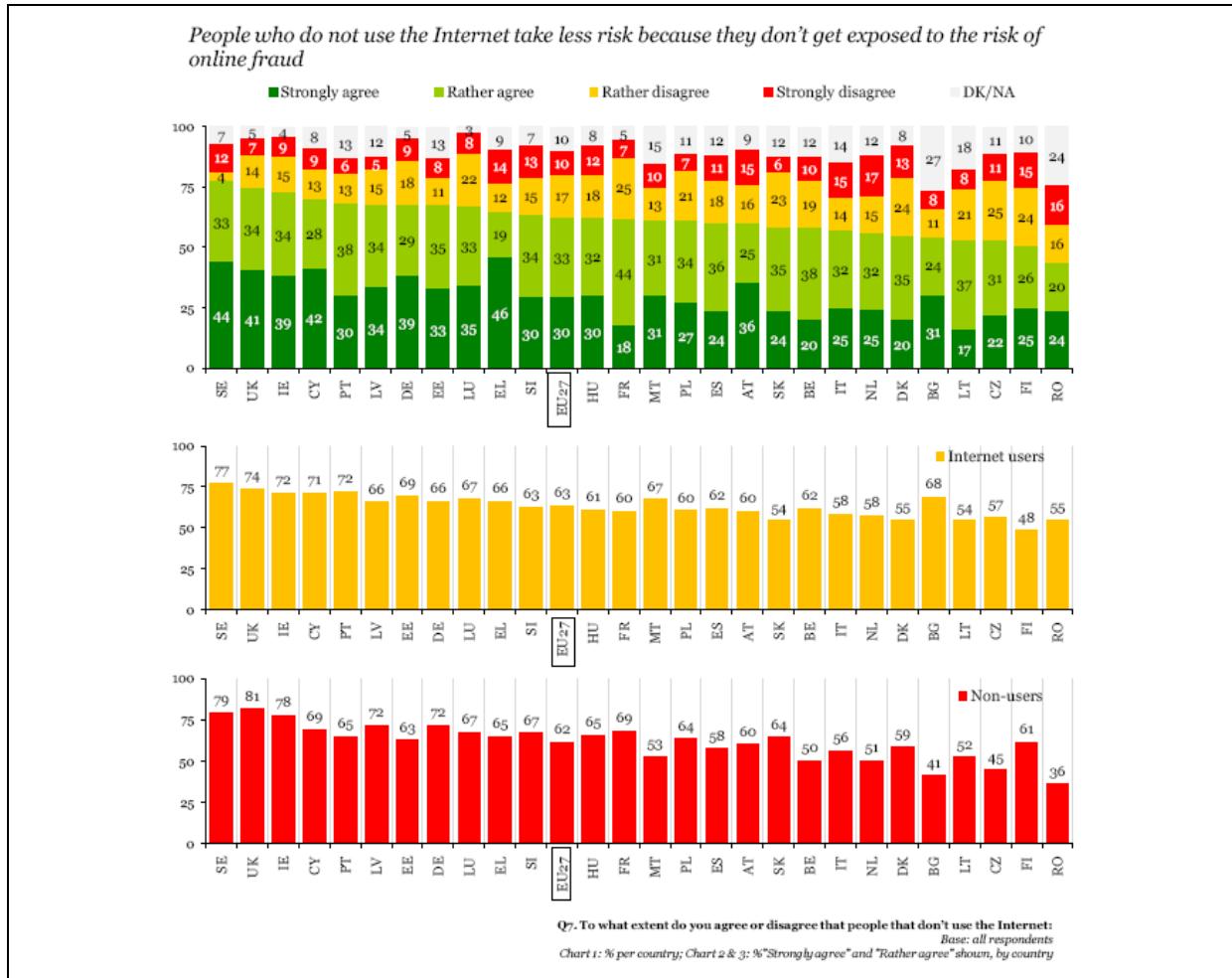
Enabler: User generated content and Web 2.0 platforms

The creation of platforms on which consumers can upload their own products and sell them directly to others, social trends in which amateurs are motivated to participate with their product and reputation based (word of mouth) transactions are important to further facilitate this type of interaction and creation. Web 2.0 technology and increased capacity of personal computers and laptops to create advanced, attractive and professional presentations of products are important in this aspect.

These are strongly linked with the networking aspects of consumption discussed in section 4.4 and it is difficult to separate consumer empowerment from participation, networking and social capital since most often these networking capacities of web 2.0 technologies is what facilitates interaction and organisation (i.e. empowerment) of consumers as well (Gillin & Moore, 2009).

Barrier: Protection by big entertainment corporations

Figure 10: Perception of risk of online fraud, 2008



Source: The Gallup Organization (2008: 48); Data source: Flash Eurobarometer 241

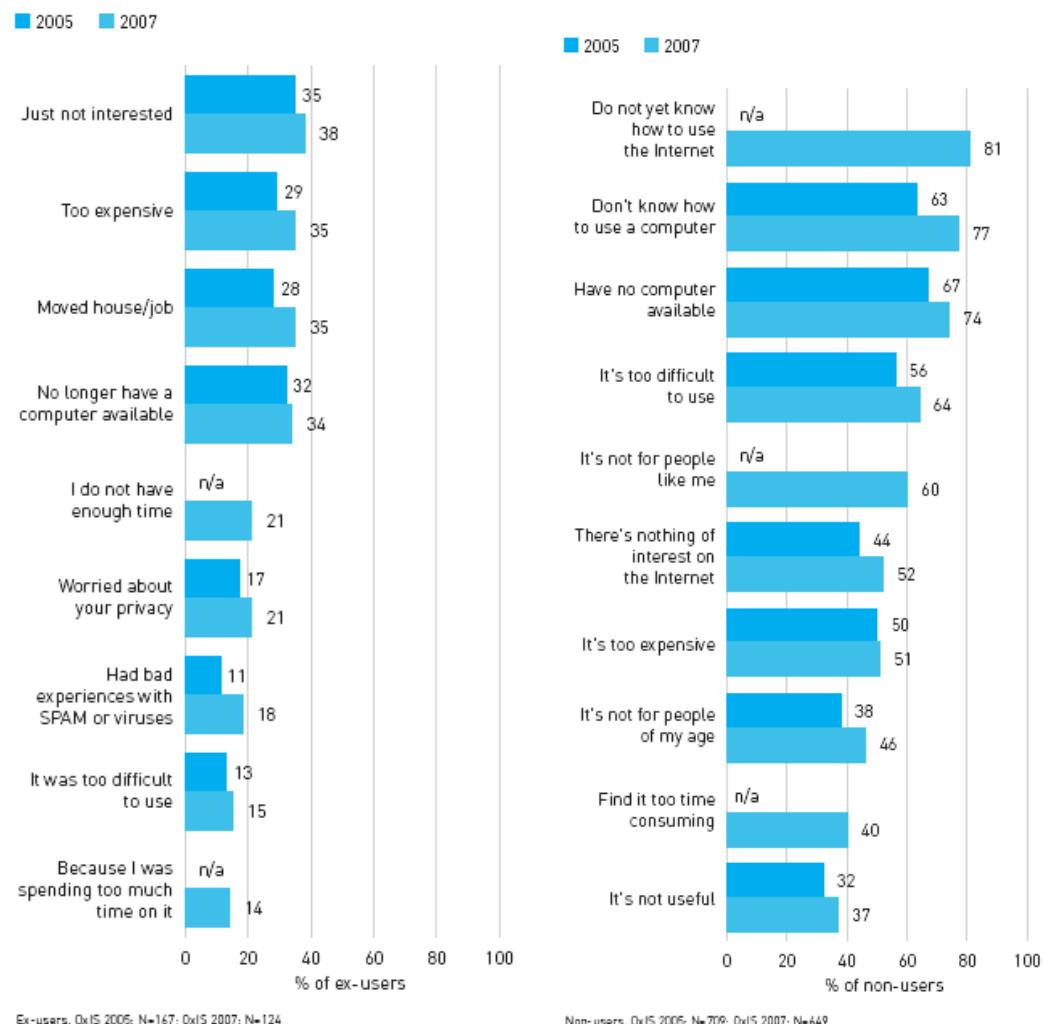
The rise of ICT and empowerment of consumers through interactivity has run into opposition from large media and entertainment conglomerates who have seen their control over their products disappear (Berman et al., 2007; DiMaggio et al., 2001; Lam & Tan, 2001; Zhu, 2001). This loss of control might be partly due to the diminished power they have over intermediaries who used to manage the emotional consumption process between the artists/creators and the consumers. The most important issues for this bigger production companies is direct-to-consumer selling by artist and creators, as well as, through the rise of prosumers/co-creators where consumers buy and sell from each other.

This is added to the **concern about piracy** mainly manifested in peer-to-peer networks which have become a vibrant exchange of amateur and professional products. The same is true for instrumental consumption, especially an issue in the travel industry where the Internet has taken the market by storm. New intermediaries are coming up and in some industries consumer-to-consumer processes are taking over this has led to resistance from

those who used to control these markets as well as from regulators who naturally prefer a clearly structured market with identifiable groups of producers and consumers and industries in which there are parties with whom to negotiate through, for example, self-regulation (Benkler, 1999, 2001).

In addition, becoming sellers as well as consumers of products exposes individuals to risks of financial fraud and identity theft by providing the personal and financial information necessary for the transactions (Swire, 2008). Sites such as Paypal have become new intermediaries which aim to protect these individual prosumers. Nevertheless, fraud and identity theft are still relatively infrequent and concerns about identity theft are not an important reason for disengagement from the Internet in general (see Figure 11).

Figure 11: Reasons for non-use of ex-users and non-users, 2005 and 2007

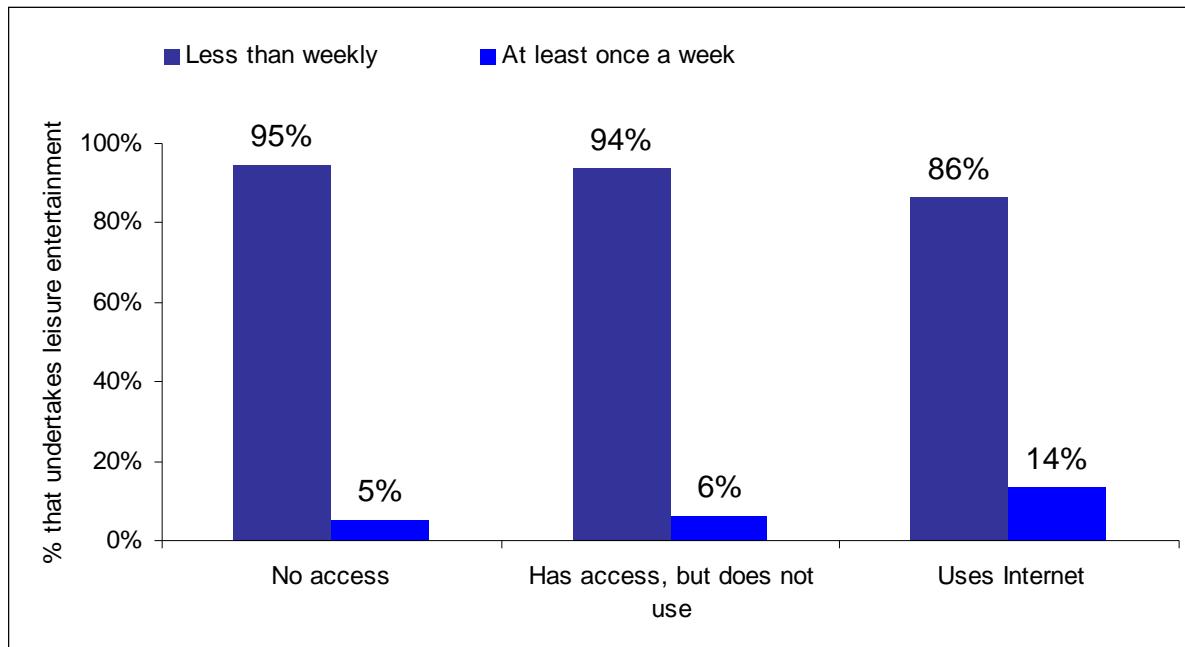


Source: Oxford Internet Surveys 2007 (Dutton & Helsper 2007)

4.4 Education and Lifelong Learning

As argued earlier there is no clear evidence that the Internet or others are replacing other means of non-instrumental consumption such as going to the cinema or even buying music. Figure 12 illustrates this with the Eurobarometer 241 data.

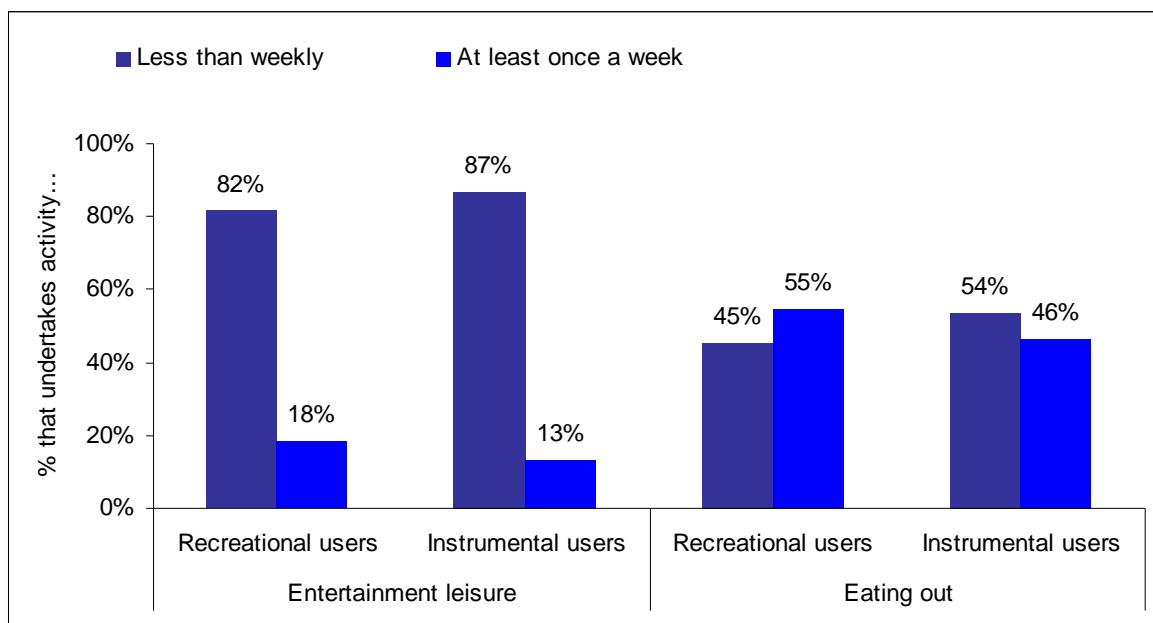
Figure 12: Frequency of emotional consumption (cinema, concerts, etc) by Internet usage, 2008



Data source: Flash Eurobarometer 241

In fact, it seems that those who use the Internet tend to be more frequent users of other traditional sources of entertainment, such as going to the cinema or theatre.

Figure 13: Frequency of emotional consumption (offline) for different types of users, 2008



Data source: Flash Eurobarometer 241

Figure 13 shows that instrumental users of the Internet (ie. those with high levels of consumption and financial transaction online) are less frequent users of emotional consumption types of activities than recreational users of the Internet, which further support the idea that the **Internet supplements already existing patterns of consumption**. In other words that offline patterns of consumptive interaction and learning are replicated in how people interact with consumption online.

The area of the intermediary in the consumption process is probably where many observe the most radical recent changes due to evolutions in ICTs. Although the traditional shop has not disappeared and the music industry is not yet bankrupt, **new applications and services have come into the picture and taken over some markets** by storm through intelligent use of the Internet. So it is not what we do but how we get it where substitution is most likely to take place.

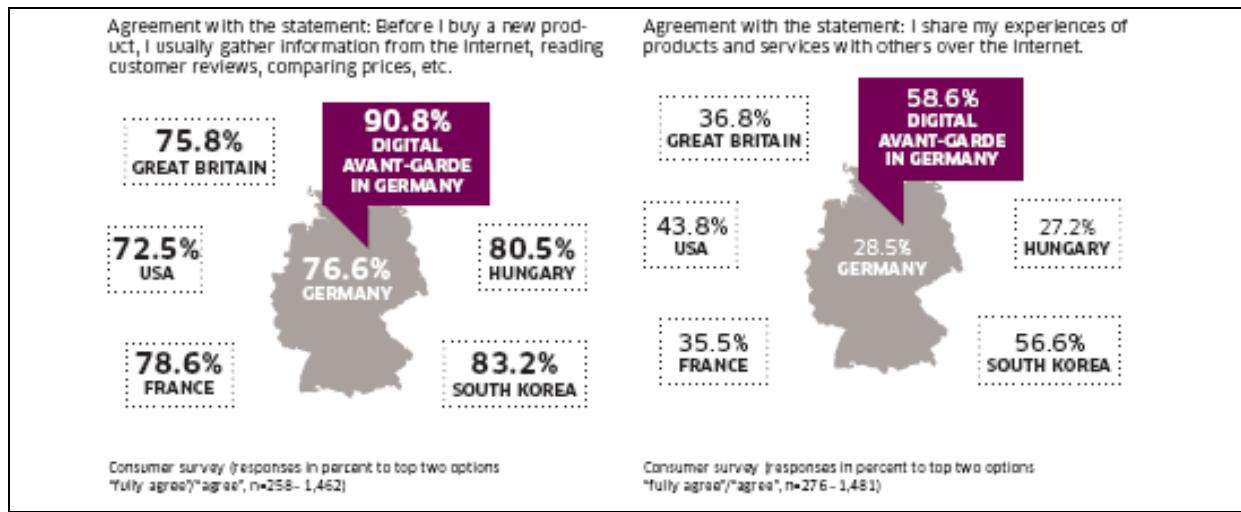
In some markets traditional intermediaries, ie. travel agents, seem to have completely disappeared and in others new intermediaries have appeared, ie. price comparison websites and information navigators (search engines).

A concrete example of the substitution of any kind of intermediary for consumption is the so called Googlisation of search and therefore of consumption. Researchers have come to realise that for many people Google and the Internet have become the same thing. The Internet, for many different actions that relate to information seeking, has become the first port of call. This centrality of the Internet and particularly Google whatever is on Google's first results page is the most likely to be bought or accessed, whenever people use the Internet to aid the consumption process (Green, 2003; Helsper, 2008; Machill et al., 2004).

Enabler/barrier: Information/Consumption overload

Notwithstanding the expansion and improvement of information searching and comparison tools, an important area of concern is related to so called 'information overload' in consumers (Lee & Lee, 2004; Ho & Tang 2001). With the proliferation of information sources, consumer skills are required to be able to select and compare the best possible offers (see Figure 14 and Figure 15). These capabilities can be provided through the structuring and design of ICTs, through requirements posed by regulators and by training and growing experience of consumers in this area (Van Zandt, 2004). Nevertheless, the question remains valid whether this development constitutes a transformation of previous practice, or simply an acceleration of existing trends.

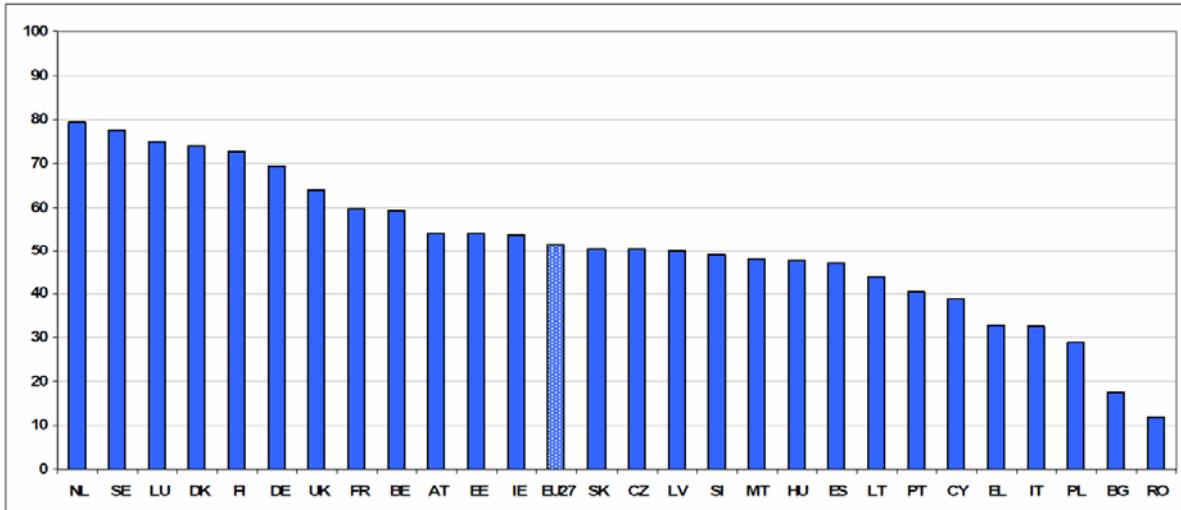
Figure 14: Pre-purchase online information seeking on the Internet, 2008



Source: Hess et al. (2009: 34)

Figure 15: Finding information about goods and services, 2009

Figure 5: Individuals who used the internet for finding information about goods or services for private purposes in the last 3 months, 2009 (%)



Source: Eurostat ([isoc_ci_ac_i](#))

Source: Eurostat Data in Focus, 46/2009: 5

It is certainly true that just enabling people from different backgrounds (e.g. different nations, cultures) to exchange information freely between each other will not necessarily yield meaningful outcomes. Many Internet users might be less interested in learning new things than in finding confirmation for opinions they already hold and in contacting people which they feel are "like them". This is especially true when there is such a wide variety of information sources available and people need to be selective to be able to cope with this sea of information. Researchers have argued that the possibility for personalising the information which one is exposed to may lead to narrow mindedness and social fragmentation (Katz & Rice, 2002). Some researchers claim that "people go on-line to find out more information about a subject, not to be transformed" (Hill & Hughes, 1998). Another argument that shows that too much information is a barrier to creating more informed consumers is that when many voices are shouting at the same time a few strong voices emerge and others are filtered out. Thus too much information might actually lead to a more narrowly informed instead of a well-informed consumer.

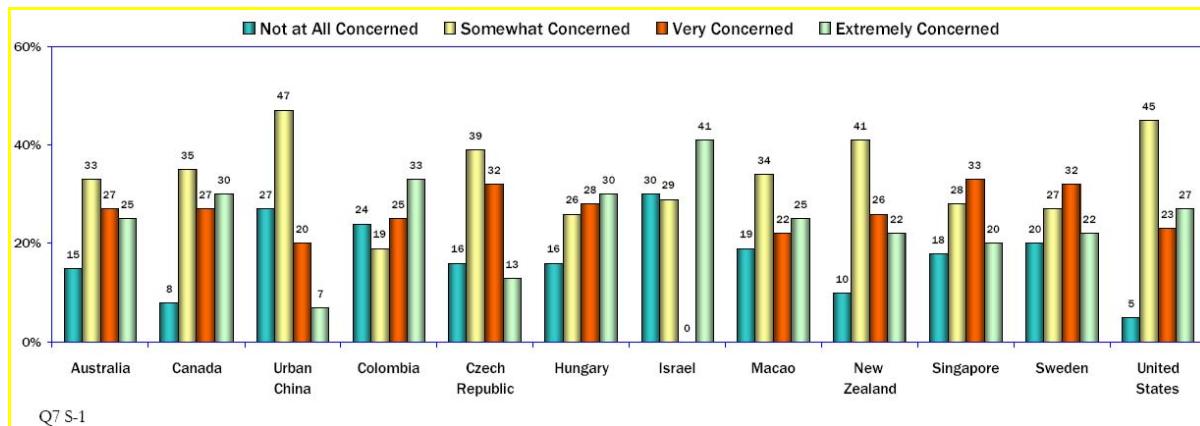
The critical skill is to manage a variety of information sources and sift through the continuous stream of information to stay informed about everything and be alerted if something relevant happens to quickly access the relevant information. To find and maintain the appropriate balance of information intake requires new skills of informational literacy. The danger is that consumers drown in information and stop consuming informational services in the first place or fail to react to the information relevant to them.

Barrier: Trust

For all types of consumption between businesses, service providers, producers and consumers one of the most important factors in any interaction is a mutual level of trust. Consumers need to trust the providers of products, information and entertainment to be reliable and deliver what is promised (Grabner-Kraeuter, 2002). Trust explains partly why services such as eBay have been successful; they provide users with information about the providers by trustworthy sources, that is, consumers like themselves (Palmer et al. 2000). A learned level of trust, that is a level of trust appropriate to the risks and situation that interactions bring, comes through experience with ICTs (Dutton & Shepherd, 2006). Similarly,

producers need to trust consumers to provide payment and use products or services responsibly. It has been argued that the Internet and other technologies that provide interactive and anonymous platforms have transformed relationships of trust due to the lack of face to face interaction and proper instruments to check the identity (and reliability) of both consumers and producers. A fine balance needs to be struck in every transaction between the privacy and identification of partners in the interactions (Olivero & Lunt, 2004). Levels of trust in the Internet are relatively high, but trust in credit card safety and in the ability to check the quality of products online is still low, Figure 16 illustrates this with data from the world Internet project.

Figure 16: Concerns about credit card security, 2009

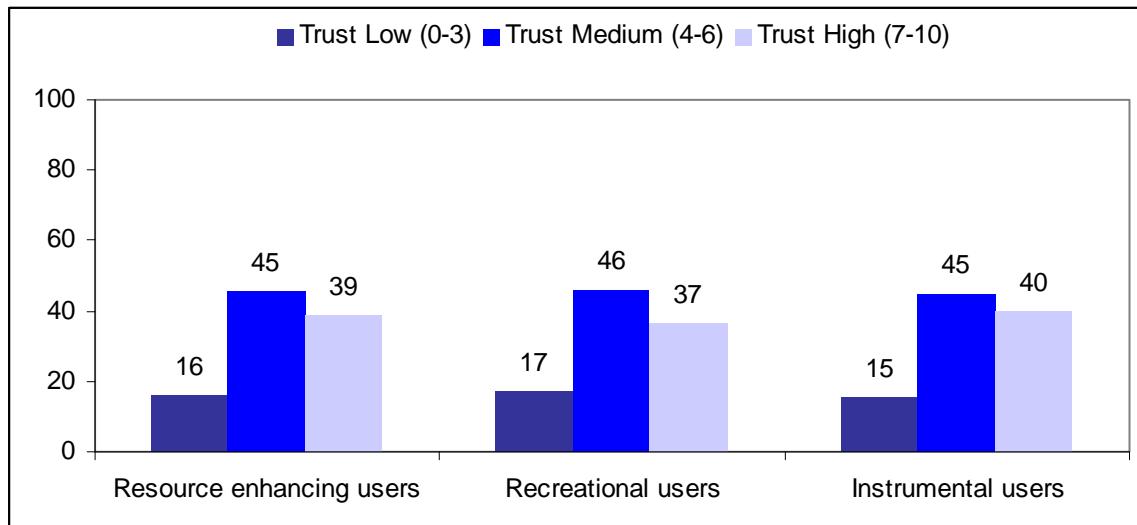


Source: World Internet Project 2009 (p.190)⁴

This lack of trust and experience with online transactions is a hurdle that is especially problematic in the area of consumption. This might turn a specific group of people away from consumption through ICT creating a gap between eCommerce sceptics and enthusiasts in the product they consume and the costs of this consumption. One could argue that an internal debate is going on, the Eurobarometer 241 shows that about the same percentage of people (70%) says that by not using the Internet people miss out on bargains as that thinks that by not using the Internet people protect themselves from possible credit card fraud. People thus have a balanced trust of the Internet, weighing the advantages and disadvantages.

There is some evidence that trust and Internet use are related that is that those who use the Internet are in general more trusting. It can be assumed that this association is even stronger for online instrumental/consumption activities.

⁴ In the UK 88% of internet users agreed strongly or somewhat that people should be concerned about their credit card details on the internet.

Figure 17: Trust and different types of uses, 2008

Data source: Flash Eurobarometer 241

Figure 17 shows for example that amongst instrumental users there are very few who have low trust levels (ie. only 15%) and more than in the other groups who have high levels of trust (ie. 40%).

4.5 Discussion

To understand what social impacts ICT has had, a useful exercise is to hypothesize about what might have happened if the developments in ICTs described in the earlier sections would not have occurred. In other words what the unique impact is that these ICTs have had in the domain of consumption. Since there is no empirical evidence to back up any speculation about what might have been, this section will close by posing a number of questions related to possible future scenarios instead of stating these possible alternatives as outright certainties. Each of these should be investigated by collecting empirical evidence in further studies, although some will simply require waiting for time to pass to see how changes accrue in the consumption domain.

- Will classifieds still exist as important source of income for traditional media?
- Will domestication have continued in traditional media with less or a different type of interactivity? Is the mobile phone a more important development in this regard than the Internet?
- Will mass consumption continue to be the norm instead of the personalisation of consumption with the absence of increased data storage and broadcast capacities, more limited data mining capacities and ever smaller, cheaper individualized ICTs?
- Will the high street have greater importance? Although there is not yet a sign that 'real' shops are being replaced by virtual shops for products for longer term consumption that require fit, feel and smell (clothes). Would the electronics, travel and music markets would have looked different?

5 Conclusions and Policy implications

This section will discuss the implications of the social impact of ICT in policymaking related to consumption.

5.1 Digital inclusion

Policy as well as technological developments could steer the future of ICTs in consumption. An important area of government policy for economic participation through ICTs is the **development of digital inclusion policies** that focus not only on access but also on skills and media literacy in relation to consumption (identifying reliable sources, separating advertising from entertainment and information, knowing how to conduct secure transactions).

5.2 Consumer protection and regulation

There is not much specific regulation for consumption and ICTs besides standard regulation that exists for offline transactions, since there is still a large issue of trust an online transaction ombudsman might be a way in which governments will regulate. The European Consumer Centre has set up an Internet Ombudsman⁵, its provenance and functionality is however unclear. Other telecommunications and communications regulatory agencies have also set up services labelled "ombudsman" but there is currently a lack of clarity on where to turn for which things amongst the myriad of different agencies.

As the internet enables consumers to engage in direct commercial relationships with producers from outside the EU, it has become easier for consumers to leave the scope of the EU consumer protection law and enforcement, e.g. the European Consumer Centres network (ECC-net) or the Regulation on consumer protection cooperation (EC No 2006/2004). Negative experiences with traders outside the EU are difficult to mitigate and could undermine the trust of consumers in online transactions. The current regulations are powerless against rogue traders from countries outside the EU. Private companies facilitating cross-border transactions, e.g. the auction site eBay, have already addressed the lack of protection. For example Ebay has created a reputation systems for all sellers to provide consumers with guidance on the reliability of the trading partner. Ebay also facilitates secure financial transactions through their daughter company PayPal and acts as a private arbitration centre for conflicts.

5.3 Copyright law and ownership

Those who have become prosumers have up until now worked in a domain where copyright and ownership were not clearly defined. It is unclear if regulation is necessary, but if indeed larger producers are starting to commoditise the work of the prosumers then some type of regulation might be needed. Is there a need for a union of prosumers?

In addition the copyright and ownership of some professions over their work is under threat, a clear example is that of musicians and artists. Although there are some who have shot to fame through low budget or even free websites and others who have changed their revenue streams through an emphasis on live performances (see creativity domain). However, professionals who produce information such as journalists, writers and to a certain extent academics might see their unique expert status suffer from the 'cult of the amateur' described earlier (Keen 2007).

⁵ <http://v2.theclaimroom.com/index.lxp?host=237>

On the other side, the **content industry has so far - with the one notable and controversial exceptions of Apple's iTunes store⁶ - failed to react to consumer's demands for convenient and licensed media services on the internet.** The complexity of copyright law leaves many consumers confused on how to recognise a legal offering. Many established and tolerated social practices, e.g. the remixing of videos and their publication on popular video-sharing platforms like YouTube, constitute a violation of copyright law. In addition, the scope of copyright and its exceptions are still not harmonised across the internal market (Guibault 2007).

Micropayment systems have so far not succeeded to gain wide consumer acceptance. The systems come with high transaction cost for the consumer including the requirement of additional authentication, prior registration, or credit card transaction fees. For international transactions, exchange rate differences make the use of micropayment systems even more unattractive. It can be observed that all major newspapers that experimented with subscription or micropayment models for their internet editions have switched to advertisement-based models, although recent moves by Rupert Murdoch to remove newspapers from Google news search and to reinstitute subscription models will be a test of whether newspapers can put the free content genie back in the bottle. A blanket license for private cultural consumption would provide a solution to connect prosumer demands with the need to remunerate media professionals (Fisher 2004). Under a blanket license regime, broadband subscribers would pay a monthly fee to a collecting society and in exchange be allowed to obtain and manipulate digital media file for their own private purposes. The collecting society would distribute the collected fees as royalties to content creators. The blanket license solution would provide consumers with legal access to digital material and enable their active participation in the knowledge society, although it is unclear how to equitably distribute these fees using current methods for tracking use.

5.4 Future perspectives

Speculating about what the future might bring is always dangerous. This section argues that the trends described in the first chapter are likely to continue and describes what this probably means for the future of consumption.

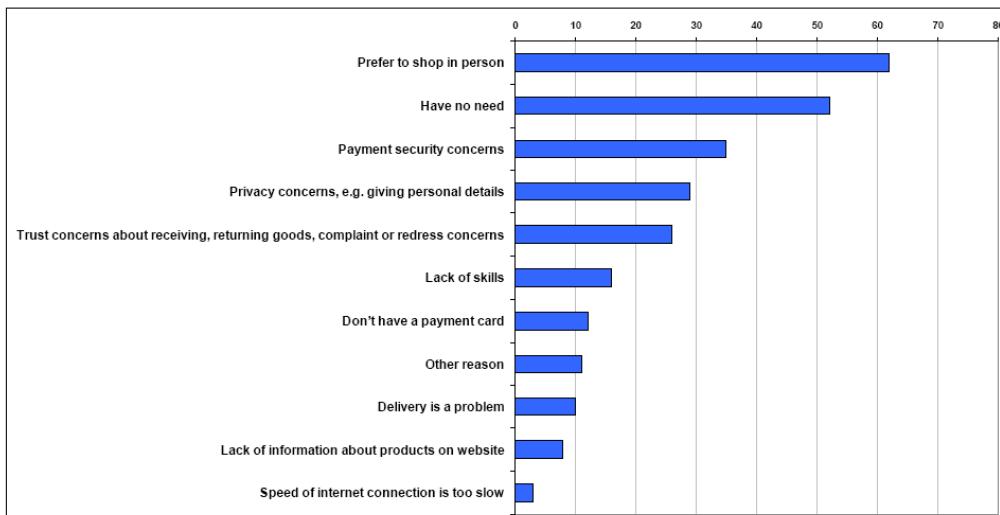
It is likely that with the increased abilities of Web 2.0 technologies and the greater accessibility of virtual world technology the online consumer experience will be further personalized and the shopping experience will be come more realistic. This might drive some markets that were not online to expand their online business.

Since shopping is more than instrumental buying and, since it is often a social experience, **offline shops are unlikely to die out** (see Figure 18). In addition the increased capacities of **mobile technologies will likely bring the ICTs to where the shopper wants to go** and make the interaction between the 'real' and 'virtual' worlds stronger and stronger. A possible development is that physical/high street shops offer an experience and focus on trust and brand building while actual transactions take place online. For example, it is plausible that a person window shops and tries on a collection of pairs of shoes while out with a friend and later buys them online where it is cheaper and delivery more convenient in general. However, if the consumer is unhappy with the purchase or has a trouble with order fulfilment, the ability to get online producers to handle such problems easily and efficiently varies widely.

⁶ See MEMO/07/126: Competition: European Commission confirms sending a Statement of Objections against alleged territorial restrictions in on-line music sales to major record companies and Apple (03/04/2007).

Figure 18: Not shopping on the Internet, 2009

**Figure 8: Reasons for not buying or ordering goods or services over the internet, EU-27, 2009
(as % of individuals who did not buy or order over the internet in the last 12 months)**



Source: Eurostat ([isoc_ec_inb](#))

Source: Eurostat Data in Focus, 46/2009: 5

A possible medium term effect of the introduction of ICT in the realm of consumption is that new ways are found to deal with information (and product) overload. Consumers are unlikely to scatter their consumption decisions among a wide variety of product and information sources. The googlisation discussed earlier will probably appear in other areas as well, that is a few key producers/intermediaries will emerge that people will start to rely on to surf the sea of available products and entertainment opportunities. Price comparison sites have already come up as new intermediaries. This is already observable in the music and news industry where the big players are trying to regain control over content on sites such as iTunes.

There is evidence for a consolidation of power in those who were traditionally powerful. Instead of a diversification of producers, people might start to rely more and more on a few, specific well-established, trustworthy producers of well-known brands (Mansell, 2009). There might be a reshuffle in these relatively early days of interactive consumption through ICTs, but many argue that the 'chaos' will settle at a certain point and that a number of strong actors will emerge that the big majority of consumers will listen to and buy from. Privacy concerns are bound to become more widespread and more serious in the future, in particular when mobile location-based services become integrated into online customer accounts and smart products and services register more and more consumer data (O'Hara & Shadbolt 2008). One could speculate that a sizeable minority of people will opt to shop offline in the future for fear of risks to privacy. This will, however, might be costly.

Interactive technology will probably increase the participation of a certain group of people in creation of products, although it is unlikely that ICT users will start producing content and products en masse. High skills (and motivation and intuition) will still be needed in the future as they are now to create sophisticated or popular content that others will want to consume. Increased participation and production in terms of feedback is likely to increase and will be demanded by consumers more and more.

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Work Research Centre

Kevin Cullen

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0 Executive Summary

This report examines the social impacts of ICTs in activities related to healthcare, with a focus on applications that are directly utilised by consumers/patients in some manner. Three main groups of application are addressed:

- 'Health on the web'
- ICT-based care delivery
- ICT support for various healthcare communications.

These groups of applications map differentially to the core social impact dimensions that are identified in the study's conceptual framework. Health-on-the-web seems most closely linked to the empowerment/participation and social capital dimensions, with impacts on these deriving from the networking and information/lifelong learning opportunities presented by the web. The other two application categories seem most closely linked to 'rationalisation' impacts, with these deriving from efficiency/effectiveness gains associated with reduced transaction costs or other logistical features of ICTs.

The issues and evidence base

Health-on-the-web

Health-on-the-web encompasses the wide variety of formal and informal online health-related services and activities that have emerged in recent years. Two main 'generations' of applications are loosely distinguished, mapping approximately to 'Web 1.0' and 'Web 2.0' functionalities and usages respectively. In the Health 1.0 era, consumer/patient activities concerned with online ('read only') health information seeking have been especially prominent, with usage of more interactive online consultation or direct advice/diagnostic support services also emerging although to a considerably lesser extent. Online purchasing of medications has also become a relevant development, often operating in a 'grey' zone as regards regulatory control and legality. The emergence of the Heath 2.0 era has heralded extensive growth in online content creation by (lay person) users, peer support groups and other usages of social media for consumer/patient health purposes.

Data from Eurostat shows that usage of the Internet by the general population for health-related purposes has been growing steadily in Europe over the past number of years. In 2009, almost one-third of the adult population in the EU27 had searched online for health information in the past 3 months, although there were wide variations across countries (from a low of just one-in-ten in Bulgaria to more than one-half of the population in Finland). Results from other surveys suggest that more than one-half of European adults may have ever searched online for health information.

Possibility of empowerment and increased participation for some, but not for all....

Although consumers/patients vary in their desire for choice and influence in relation to health matters, the evidence suggests that many feel more empowered as a result of being able to

find health-related information and support on the web. Most consumers/patients who look for health information online report being better informed, and this can be brought to bear when making healthcare decisions and in interacting with doctors. They also have the possibility to use online rating sites to record and voice their experiences of health providers they have used. On the other hand, the Internet has extended the reach of various vested interests and their potential to influence consumers/patients, for example, in the advertising and marketing of medications. Some web-based and other eHealth applications also raise the possibility of increased transparency of customers to insurers.

Many people are now researching health information before and after consulting their doctor, and a minority report having made their own health decisions (including sometimes not following their doctor's advice) as a result of information found on the web. A sizeable minority of Internet users in Europe also report having had an online interaction of some form with a doctor or health professional that they have not met. Although there is currently a lack of robust evidence on the impacts of these developments on the traditional doctor-patient relationship or on 'gate-keeping' mechanisms in healthcare, overall it seems that health-on-the-web has not yet led to a substantial bypassing of the existing 'bricks-and-mortar' health system. The 'grey' area of online marketing and purchasing of medications remains an issue, however.

Finally, there are various health-on-the-web developments (such as provider rating sites and 'choose and book' services) that, at least in principle, can give consumers/patients more choice and/or more information to support choice in what hospitals, specialists or other healthcare facilities to select when such services are needed. Although this can increase the possibilities for informed choice, available evidence suggests that consumers/patients still give most regard to the recommendations made by their own doctor. In addition, it seems that constraints within the 'bricks and mortar' health system can often limit the possibilities for real choices to be exercised in practice.

Overall, the Internet has made a lot more health information available, and more easily available, for consumers/patients. However, the quality may be variable and there can be risks of overload so users need good 'eHealth literacy' skills in order to get the most of this. In addition, whilst health-on-the-web may empower in various ways those who have access to the Internet, the flip side of this is that those who are not online may become relatively more disadvantaged in relation to health matters. For them, the experience may be more one of dis-empowerment through inability to participate in new opportunities. Factors linked to existing health divides, including lower health literacy and less proactive health orientations continue to contribute significantly to unequal health experiences and outcomes of less advantaged socio-economic groups. There is already some evidence that these groups may be experiencing a 'double jeopardy' as a result of an intertwining of these traditional health divides with the new digital divides.

Finally, 'health 2.0' applications provide potential for collective empowerment through mobilising interest groups and facilitating collective action. One relevant development is the growth in websites providing user ratings of experiences with healthcare providers. This may potentially encourage increased quality standards, although there seems not to be strong evidence for this as of yet. Other emerging developments include the possibilities for new collaborative relationships between consumers/patients and professionals, such as collective pooling of experiences of side effects of medication or other health experiences, and some examples of this can already be found.

Health-related social capital online?

There are now very many health support groups operating online and large numbers of consumers/patients are participating in these. Participants are clearly gaining social benefits and, although direct evidence is still very limited, it is possible that such groups may be providing the type of social support that socio-medical research has found to play a major role in positive health experiences and outcomes more generally. Further research would be

useful in order to assess the extent to which virtual support can also deliver the positive health impacts that have been found for more traditional forms of social support.

ICT-based Care delivery

For this application category, the main focus in the report is on home telehealth and telecare, involving remote delivery of health and/or social care to the home on an ongoing/continuous basis. Some consideration is also given to remote consultation of an episodic nature and to personal (self-care) health systems / devices.

Home telehealth involves continuous (remote) monitoring of the health status and wellbeing of a patient at home, and may include subjective reporting of symptoms and/or objective measurement of various physiological parameters. It has a particular relevance for providing continuing care to people with chronic conditions (many of whom are older people) and is seeing growing application for conditions such as diabetes, chronic obstructive pulmonary disease and various cardiovascular diseases.

The term telecare is generally used to refer to remote social care and support for independent living for older people, with the focus more on social as opposed to medical needs. Three 'generations' of telecare can be distinguished - first generation telecare (often called 'social alarms'), involving systems that enable older people to easily call for help in case of emergency; second generation telecare, involving additional home environment sensors that enable alerts to be triggered automatically; and third generation telecare, involving more extensive monitoring of activity and lifestyle. A core emphasis of telecare is on safety and security, in the context of a more general aim to enable older people to remain living independently in their own homes for as long as possible.

The available data indicate that first generation telecare is widely available in many European countries and is often well-integrated into the mainstream social care systems. However, levels of take-up amongst older people vary quite widely across countries, ranging from less than 1% to more than 15% of people aged 65 years and older. More advanced telecare services are beginning to be deployed, but have yet to become mainstreamed in most countries.

Home telehealth has been talked about for some time but seems only recently to be on the verge of becoming mainstreamed as a part of regular healthcare service offerings and, even then, only in some countries and to a limited degree as of yet. In general, the numbers currently using home telehealth systems/services are still very low, with the most extensive implementations to date probably to be found in the US and Japan.

'Win-win-win' potential.....but what are the ethics?

Many commentators have suggested that telecare and home telehealth offer considerable potential to deliver a 'win-win-win' scenario, whereby the needs of older people are supported whilst simultaneously helping with cost containment in health and social care systems and opening up new markets for European ICT and related industries. This is seen as an important opportunity in the context of the challenges posed by demographic ageing. Although many trials report quite promising results in this regard, the available evidence is still limited and there is a need for more robust assessment as well as better consolidation of the growing but widely scattered existing evidence-base. In some cases, the technologies and applications are quite well proven, but the social and organisational aspects of their implementation seem to be a lot more challenging. More generally, the evidence shows substantial variations in levels of usage of first generation telecare across countries that have had such services available to older people for many years. This suggests that the perceived importance and role/contribution of telecare in the overall social care system may vary considerably across countries.

There are also important social and ethical issues that arise in this area, such as maintenance of privacy and dignity when implementing applications involving surveillance of the home and/or lifestyle monitoring. Overarching issues around how much emphasis should be given to technology-supported care in the search for solutions to the long-term care challenges posed by demographic ageing and about the implications of these applications for the sharing of caring responsibilities between formal care services and the family also need to be addressed.

ICT support for various healthcare communications

The report also addresses applications of ICT that support a variety of common healthcare communications between the mainstream healthcare system and patients/consumers. These include eAppointments, eBooking, ePrescriptions and eReminders, as well as other forms of targeted informational and/or educational communications to individuals.

Overall, email interaction between general practitioners and their patients, whether for administrative purposes or for health matters, is not common in the majority of Member States as of yet, although there are some exceptions. More generally, the extent of provision of websites by general practitioners varies widely across Europe, ranging from almost all in Finland to only a small minority in Latvia.

Some countries have well-developed online services in other areas, such as booking appointments with hospital- or clinic-based services. ePrescription is growing in Europe and is well-established in some countries. Use of eReminders is becoming quite commonplace, especially appointment reminder by phone or text messaging, and sometimes by e-mail. Medication reminder systems are also being implemented, although on a more limited basis to date. There has also been a growing interest in provision of other forms of healthcare information/education 'push' services, using Podcasts, mobile texting, Digital TV and other platforms.

Good potential for rationalisation benefits....texts may have better reach across social groups

These applications offer good potential for rationalisation benefits. For example, programmes involving text-messaging of health-related reminders to mobile phones have often reported beneficial results, including positive patient experience, reductions in non attendance and positive impacts on medication adherence. Various beneficial impacts have also been reported for uses of mobile text-messaging in public health programmes, including contact tracing and partner notification for communicable diseases, rapid communication of health information to the general public in case of epidemic, and for programmes such as smoking cessation. However, the evaluation methodologies used in these studies have varied considerably in their robustness and peer reviewed clinical research has so far been limited. More generally, the use of mobile text-messaging seems to bring the possibility of better reach across social groups than is the case for the Internet and some commentators have suggested that this medium might be important in helping to reduce 'eHealth divides' in the population.

EU policy implications

A complex field, spanning a range of policy domains

The evidence and analysis presented in the report covers a wide range of healthcare activities and dimensions of social impact. Given the focus of this study on *social* impacts, the report raises the question of what phenomena and what 'outcomes' should be given central place in deriving policy implications. Should the main emphasis be on concrete 'final' outcomes in terms of health impacts or should equal or greater attention be focused, in their

own right, on the social phenomena that are emerging? The dimensions of central interest may also vary across policy areas. Social policy, for example, might emphasise issues such as equality, social cohesion and active citizenship; public health policy might emphasise the ultimate impacts on the health of individuals; consumer policy might emphasise issues of consumer choice and consumer protection in health matters; health economics might emphasise issues of cost-effectiveness and cost-containment; and industry support policies might emphasise the possibilities for growing new markets for innovative ICTs in the consumer/patient-oriented healthcare field. A coordinated perspective spanning information society, public health, social and consumer policy therefore seems warranted in this field. Finally, the report also discusses some different visions - business-as-usual, economic and transformative - that could underpin policy in this field.

The question of the maturity of the field of enquiry as regards capacity to support evidence-based policy is also raised. There is a very wide range of existing evidence, some from research from the medical/healthcare perspective and some from sociological and other disciplines. A diversity of methodologies has been employed, with a consequent diversity in the rigorousness and robustness of the resultant evidence-base, as well as incomplete coverage of the full range of issues of policy interest. For some issues the trends are already quite clear; for others the phenomena of interest are only emerging and/or the necessary research has yet to be conducted.

The analysis also recognises that EU policy needs to be developed in compliance with the principles of proportionality and subsidiarity. Assessing issues of proportionately in this field will require calibration of the importance of the variety of social phenomena and impacts that can be discerned, and identifying the types of intervention that are possible and appropriate at EU level. As regards EU subsidiarity principles, the wide heterogeneity of healthcare systems across the Member States presents an important contextual backdrop that needs to be taken into account. For example, the realities of consumer/patient choice and empowerment vary widely across the Member States, even if the rhetoric is often the same. To be truly empowered, consumers/patients need not just be to be better informed (and health-on-the-web can substantially contribute to this) but also to have access to a healthcare system that is receptive to the informed consumer/patient and offers the necessary degrees of freedom to enable informed choice.

Some concrete suggestions for policy

Although the elaboration of policy in this field requires reflection on the types of issues outlined above, the report nevertheless makes some initial concrete suggestions for a number of policy actions that seem warranted on the basis of the available evidence and the analysis that has been conducted. These are:

- greater policy attention could be given to 'health-on-the-web': there could be increased focus on this domain within eHealth policy and more attention given to the important issue of 'eHealth literacy' for consumers/patients; this could be supported by more in-depth benchmarking of developments across the EU, including surveys of users and mapping of the supply side
- an EU-driven policy initiative could be implemented to examine the social and ethical aspects of telecare and home telehealth in long-term care for older people; actions at EU, national and local/regional levels could be promoted, bringing together relevant stakeholders such as policy-makers, user groups (older people, family carers), RTD/industry, long-term care services, social scientists and applied ethicists; more extensive research on the social and ethical dimensions in this area could also be supported
- focused efforts could be initiated to address the cultural, organisational and other systemic barriers within healthcare that have tended to impede wider provision and

exploitation of patient-facing eHealth services, and limit their integration within the mainstream 'bricks-and-mortar' healthcare system and processes; this would need to involve the Member States as well as other relevant stakeholders such as professional associations, and be supported by research to improve the available evidence-base in this area

- support could be provided for more European-focused evidence gathering in this field (much of the current evidence and research emanates from the US); this could include benchmarking, case studies, consolidation of available evidence, and multi-disciplinary studies, with an emphasis on cross-country research to identify European best practice and support policy coordination at EU level.

1 Introduction

This report examines the social impacts of ICTs in activities related to healthcare, with a focus on applications that are directly utilised by consumers/patients in some manner. Three main groups of application are addressed:

- 'Health on the web' (encompassing the wide variety of formal and informal online health-related services and activities that have emerged in recent years)
- ICT-based care delivery (especially telecare and home telehealth for older people)
- ICT support for various healthcare communications (such as eAppointments, eBooking, ePrescriptions and eReminders, as well as other forms of targeted informational and/or educational communications to individuals).

These groups of applications map differentially to the core social impact dimensions that are identified in the study's conceptual framework. Health-on-the-web seems most closely linked to the empowerment/participation and social capital dimensions, with impacts on these deriving from the networking and information/lifelong learning opportunities presented by the web. The other two application categories seem most closely linked to 'rationalisation' impacts, with these deriving from efficiency/effectiveness gains associated with reduced transaction costs or other logistical features of ICTs.

The organisation of healthcare varies considerably across countries, including the extent to which a well-organised 'system' or more loosely organised 'market' is in place. Healthcare 'systems' are more or less 'generous' in the range and amount of services that are offered to consumers/patients and in the costs of these services for users, and also vary widely in the amount of choice available to consumers/patients. The relevance, value and impacts of particular consumer/patient-facing ICT applications can be expected to differ across systems that vary in these ways. However, the current capacity to model healthcare systems and assess or predict the impact of ICTs is still quite limited and primitive.

More generally, there are various lines of social tension within healthcare systems. One is the tension between cost containment and provision of sufficient, high quality services. Another is between economic and profit motivations versus the provision of public goods. Linked in part to these is the tension between system control of access/utilisation and consumer/patient-driven choice. There is also the central issue of the power balance between professional and layman, with implications for doctor-patient relationships and the definition of appropriate roles for each party. Increasingly, there is also the issue of where care should best be provided, with a growing movement towards moving healthcare from institutional settings, such as hospitals, to the community and especially to the home. The increasing globalization of healthcare, including cross-border healthcare and medical tourism can also be mentioned. Finally, there are the key issues of equity in access to services and of health inequalities across socioeconomic groups that persist to today.

Apart from this, healthcare systems are faced with the challenge of demographic ageing. This is leading to a major increase in the numbers with chronic diseases and in need of long-term care. There is a new emphasis on provision of health and social care services to older people living in their own homes, and on supporting independent living.

This report examines the social impacts of ICTs within this complex arena, with a focus on consumer/patient-facing applications. The report develops a conceptual structuring of the domain, presents available empirical evidence on trends in supply and usage of consumer/patient-facing applications and on the social impacts as they can be observed to date, and draws some conclusions and policy implications on the basis of this.

2 Epochal trends and the arrival of ICTs

2.1 Major trends and current issues in the healthcare domain

It is not a straightforward task to identify major 'social' trends in healthcare as different perspectives (e.g. patient, professional, and payer) bring different sets of issues to the fore. However, a simplified analysis of major policy orientations within the general frame of healthcare 'reform' or improvement indicates three main recent waves of focus and activity (Mossialos and Le Grand, 1999; Smith, 2000; Institute of Medicine, 2001).

Three waves of change / reform in healthcare

Cost containment, through demand management (1980s):

- gate-keeping (access is controlled by those authorised to make referrals, especially GPs)
- increasing requirement for co-payments
- shift from institutional to community care

Introduction of competition and markets to promote efficiency (1990s):

- provider (quasi-)markets established (separation of procurement from provision)
- new payment mechanisms (DRGs for hospitals; varying arrangements/incentives for physicians)
- purchaser market facilitation (e.g. consumer choice of sickness funds)
- provision of comparative information (e.g. performance, provider ratings...)
- emergence of the 'health consumer'

Focus on effectiveness, quality and equality (2000s):

- professional improvement / evidence-based medicine (quality assurance, using clinical guidelines and protocols); technology assessment
- patient empowerment (choice of provider and treatment - some countries aiming to increase, others to curtail; better informed patients; self-care)
- increased focus on disease management / better care for chronic conditions (rather than episodic approach); integration of healthcare and health/social care; these being especially important in meeting the challenges posed by an ageing population
- renewed focus on reducing health inequalities and 'divides' (especially those linked to socio-economic status)
- cross-border healthcare / mobility of patients (within Europe and further afield).

2.1.1 Need for better information management, access and application

Despite these various reform efforts, a number of key challenges remain (e.g. Whitehouse, 2004), including high costs, uncertain value, medical errors, variable quality, administrative inefficiencies and poor coordination. There also remain significant practical challenges in areas where ICTs might have been expected to modernise processes, including patient's information scattered across many places; physicians still keeping most of their information/knowledge in memory; medical orders and prescriptions still often handwritten; and physicians not always having the best and most up-to-date information on treatments.

2.1.2 Informing and empowering patients

Some commentators suggest that the trend towards better informing and empowering patients is the biggest potential source of change in healthcare today. Historically, some

trends that have been linked to the emergence of the patient empowerment philosophy or movement include (Harris and Veinot, 2004): growth of self-help and mutual aid groups over the last three decades; emergence of healthcare 'consumerism'; growth of alternative medicine; growth of patient organisations and activism; cost-containment policies based on shifting responsibility for much of healthcare to the consumer, as well as the de facto need for patients to act as the care integrator under the typically fragmented systems in many countries; and the information and networking capacities of the Internet.

These developments have been viewed by some as having a radical potential to redistribute responsibilities and power in access to healthcare, as well as to increase people's ability to look after their health. The theme has come to feature quite strongly in the healthcare policy rhetoric across Europe, especially the view that citizens should take more responsibility for their own health to improve overall health results and to moderate expenditure. In the context of the current study, it is perhaps in this information / empowerment area that the most radical social impacts of applications of ICTs may be expected to be found, especially around the growth of the web as a key medium supporting the health care activities of substantial segments of the population in many countries.

The concept of '**health literacy**' is closely linked to the empowerment theme. In the WHO's health promotion glossary the following definition is given (Nutbeam, 1986):

"Health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health. Health literacy means more than being able to read pamphlets and successfully make appointments. By improving people's access to health information and their capacity to use it effectively, health literacy is crucial to empowerment."

Health literacy in regard to traditional health information and communication media (doctor-patient communication, family health reference books, magazines, TV etc.) is an important factor in observed health inequalities (US department of Health and Human Services - <http://www.health.gov/communication/literacy/quickguide/factsliteracy.htm#fifteen>) and can be expected to become increasingly important with the explosion of online information and services in the healthcare domain. In addition to its direct social (equality) importance, there is emerging quantitative evidence of the very substantial economic importance of health literacy in terms of costs healthcare systems (Wang and Schmid, 2007).

The increasing role that ICTs and especially the web play in the health-related activities of a substantial proportion of the population means that a new requirement for '**eHealth literacy**' has emerged, where the skills needed relate not just to health information but also to effectively navigating and using health information and resources on the web. There is a concern that a new **eHealth divide** may emerge, fuelled by the double jeopardy that many disadvantaged people experience – lower likelihood to be users of the Internet in the first place and, if they are, the likelihood that eHealth/health literacy may limit their possibilities to gain what benefits may be on offer.

2.1.3 Healthcare needs of an ageing society

Finally, it is important that the analysis gives appropriate attention to the ageing of the population and to the social impacts of ICT applications in healthcare in relation to this. On the one hand, older people will comprise an increasingly large share of health service users and of health consumers more generally, so that issues of informing and empowering older people are of particular relevance as well as the issue of age-friendliness of the ICT-based technologies and services that enable this. More generally, it has been suggested that particular applications of ICTs, especially telecare and home telehealth, may have a significant role to play in helping to meet the healthcare needs of an ageing population. This may prove to be a cost-effective approach but also raises questions about the possible social

impacts, both positive and negative, of delivering healthcare in new ways and in new locations, especially the home.

2.2 ICT implementation in the domain

There seems to have been no single perspective or 'vision' driving ICT implementation in the health domain, which may not be so surprising when one considers the mix of activities, players and interests that are involved. In general, the evolution of the application of ICTs in healthcare has been very slow, although diffusion patterns have varied quite widely across systems and types of healthcare facility (Ponkych and Taylor, 2005). Early expectations that ICTs would join-up and integrate the healthcare system, and be widely adopted to support clinical decision-making, have been slow to become realized. The same has been true of early expectations that consumer health informatics would flip over the health 'power pyramid' and change what has been viewed by some as the 'paternalistic' sentiment of modern medical practice (e.g. Ferguson, 1995).

2.2.1 IT in healthcare organisations

One line of application of ICTs in healthcare began to emerge in the early 1970s through the use of shared systems, which then developed with the availability of minicomputers. Initial market penetration was mainly in hospital systems and, to a lesser extent, in physician practice management systems. The focus was first on billing and other financial applications, then automation of other administration functions emerged (laboratory, radiology, pharmacy). Developments were limited in the first 10 years because of insufficient file capacities and most systems were designed individually for a specific hospital or doctor's practice. Introduction to clinical processes was very slow, influenced by professional resistance and other factors. Very often, the expected benefits were not realized and there were many examples of system failure to deliver. In general, it seems that a very long timeframe for ICT implementation has been needed, especially in large organizations.

Only in the last 5-10 years has the emphasis shifted from applying ICT to hospital or practice administration to applying it to the clinical process. The focus of healthcare ICT has been changing, from an emphasis on hardware, systems architectures and databases, to innovative uses of ICTs for facilitating communication and decision-making, and a growing recognition of the centrality of human and organizational factors in the healthcare ICT context (Pagliari et al., 2004).

2.2.2 IT for integration and coordination

For many years the application of ICTs in healthcare was mainly localised, with specific systems developed for each individual unit/player. This was a barrier to joining-up systems to support the integration and coordination of the different players that is necessary for efficient, quality healthcare services. More recently there has been an emergence of more integrated health networks at local, regional and national levels, although the extent of coordination and interworking is still limited in many instances. Linked to this has been the very slow development of the Electronic Patient Record (EPR) field, especially as regards comprehensive records with shared access across the relevant healthcare players. Only in recent years have some substantive applications emerged in this field. Other emerging applications with some level of implementation include ePrescription, eReferral/Booking, 'eLabresults' etc.

2.2.3 Telemedicine, telehealth and telecare

Another line of application of ICTs has developed in the fields of remote health and social care provision.

On the one hand, telemedicine developments were driven especially by the desire to serve underserved rural populations in countries such as the US, Canada and Australia. The focus was on real-time or store-and-forward communications from local rural healthcare facilities to urban centres of expertise. Emergence of direct telehealth to the home was much slower, but now seems on the verge of becoming a mainstream approach to the care of chronic conditions such as diabetes, heart disease and respiratory disease.

On the social care side, social alarm services emerged in the 1970s which provided basic tele-support to older people and those with chronic conditions in their own homes. For many years there was little real enhancement of the basic model of client-initiated alarms and voice links with a support centre. In recent times there has been quite rapid evolution of telecare systems, with second generation systems now providing a range of passive sensors and other functions to support independent living. Third generation systems are also being developed and tested, that will provide the capacity for continuous activity/lifestyle monitoring and interpretation.

Both telecare and home telehealth are now being viewed as important solutions to meeting the healthcare needs of an ageing population.

2.2.4 Patient-oriented / consumer-oriented systems

The 1990s saw the emergence of computer-mediated health promotion applications aimed at patients, initially based on PC applications, although these seem not to have been very widely implemented and used in practice. Since the emergence and take-off of the Internet and web, however, there has been an explosion of information and other online services aimed at patients/consumers. However, online patient-doctor communication has been slow to emerge and ICT-based access to one's own personal medical/health history (ePHR) is still in its infancy.

2.2.5 eHealth today

Nowadays, the term *eHealth* has come to be used as an umbrella concept covering a wide range of applications of ICTs in the healthcare context. The meaning and scope of the term seems to vary quite widely and it has been variously used as a synonym for such disparate applications as health informatics, telemedicine, consumer health informatics and e-business in the healthcare sector (Pagliari et al., 2004). The most basic definition would be (Eng, 2001): '*use of emerging information and communications technology, especially the Internet, to improve or enable healthcare*'. However, other commentators (e.g. Eysenbach, 2001) suggest that the term characterizes not only a technical development, but also a new way of working, an attitude, and a commitment for networking (between all players and levels) supported by ICTs.

2.3 Major social impact dimensions

A review of definitions and perspectives on eHealth suggests that commentators have mainly associated it with positive connotations/expectations (Oh, 2005), such as 'benefits', 'improvement', 'enhancing', 'efficiency', 'enabling', even allowing patients and professionals to 'do the previously impossible'. Nevertheless, not all stakeholders have tended to view all applications in a completely positive light (e.g. concerns expressed by doctors about health information on the Internet and the ways that patients use this).

More generally, when the various changes and trends outlined above are considered, it is clear that there is no single 'social change' axis or trajectory running through the various health sector reforms and trends. Some aspects have a more indirect or generalised social impact, in the sense that positive developments bring social benefits for all healthcare users (e.g. where efficiency gains are translated into qualitatively and/or quantitatively improved services) and even for the whole of society. Some aspects have strong social impacts within

the healthcare system, for example in the ways that they affect healthcare organisations and the working practices of the very large numbers of people that are employed within the sector.

However, for purposes of this study, the perspective taken will be primarily from the point of view of direct impacts on the individual 'patient' or 'consumer'. From the patient's or consumer's point of view, the most direct social impact dimensions would seem to revolve around issues of quality of healthcare services (in terms of both accessibility and clinical quality); informing and empowering patients and consumers (to make choices, manage one's health); equality (of access to services and to benefits of innovations); changes in the location of healthcare (especially to the home); and, of course, 'final' impacts of all this on health status. These aspects are kept to the fore in the presentation and analysis of evidence on social impacts in Section 4.

3 Applications of ICT in the domain

Healthcare is a complex domain, where a range of players - providers, practitioners, patients/consumers, payers, pharmaceutical companies, healthcare product manufacturers, and others - interact to deliver and use the public and commercial goods of 'healthcare'. There are a very wide range of ICT applications in healthcare and many different ways that these can be classified. As a starting point it is useful to overview the territory in terms of the applications that map to the core interests and needs of key players such as payers, providers, practitioners, patients and product (industries).

The various players have different perspectives and interests within the overall functioning of the 'system', even if these align to a greater or lesser extent within particular healthcare systems or parts of particular systems. ICT applications that support their own core interests can be expected to be of particular importance and value for the respective stakeholders.

Payers (e.g. insurers) are likely to be especially interested in demand management and cost containment. Providers (e.g. hospitals, clinics), in addition to their core function to deliver quality health services, are also likely to be interested in cost containment, and both quality and cost-containment are closely linked to efficiency and effectiveness in the logistical aspects of their operations. Practitioners (e.g. clinic- and office-based doctors) need to deliver a quality service, often in the face of heavy workloads, as well as maintain their medical knowledge and skills, and effectively manage their practices. The pharmaceutical and medical devices industries need to continually innovate and develop new products, as well as effectively market these. Patients/consumers need access to good quality services wherever they live and whenever needed and, increasingly, desire information to support them in actively engaging in the management of their own health. There is also the major importance of the healthcare sector as a source of employment in most economies. Finally, of course, for many of the players in the healthcare sector, profit or income maximising are central motivators. This includes providers and practitioners in many but not all countries.

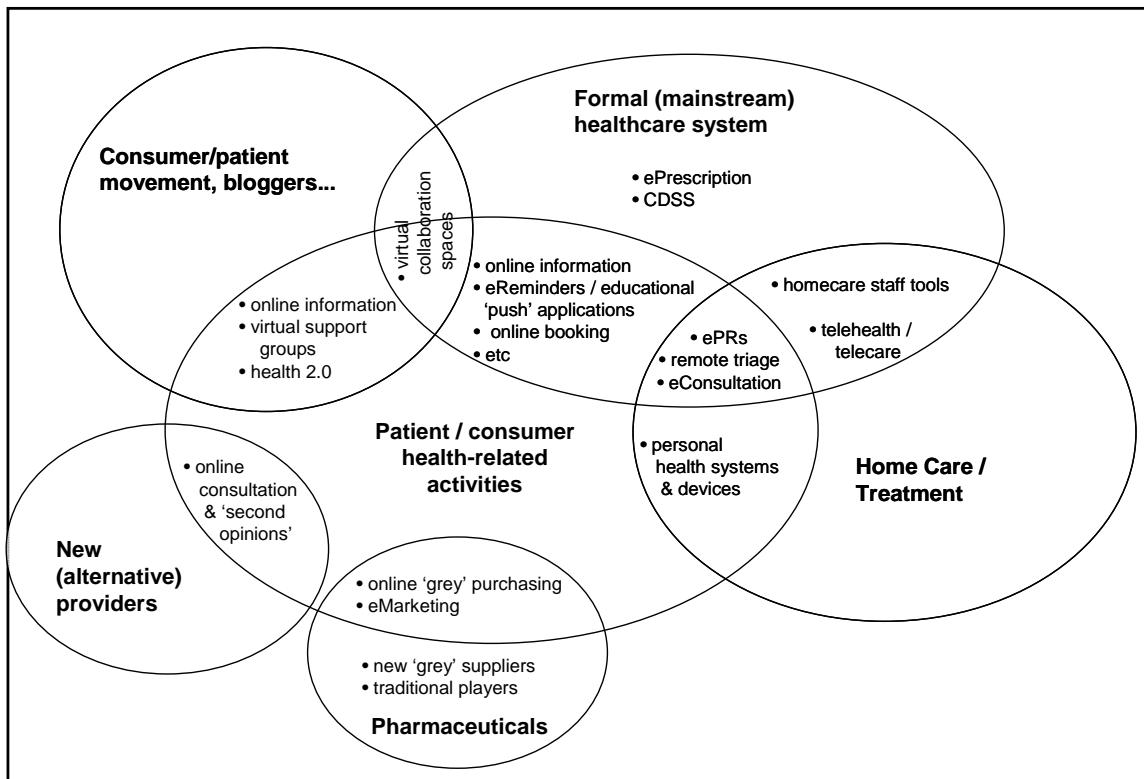
A summary overview of some of the interests/needs, exemplar ICTs and social impact dimensions that are relevant in relation to the different players is presented in Table 3.1. In the Table, shading is used to indicate the main thematic focus of the social impact analysis to be conducted in this report, concentrating on ICTs that directly interface with consumers/patients in some manner and the social impacts associated with these.

Table 3.1: Healthcare players, exemplar ICTs and associated social or other key issues

Players	Payers	Providers	Practitioners	Patients	Product & pharma industries
	e.g. public and private insurers	e.g. hospitals, laboratories, clinics, pharmacies, home care agencies, etc.	e.g. GPs, specialists, nurses, etc.	e.g. in roles as patients, consumers, clients, carers, etc.	e.g. medical devices, pharmaceutical industry, etc.
Some core interests / needs	<ul style="list-style-type: none"> • demand management • cost containment 	<ul style="list-style-type: none"> • deliver quality health services • cost containment • scheduling / patient management • system integration (internal and external) 	<ul style="list-style-type: none"> • continuing education / knowledge acquisition • practice administration • clinical support • income maximisation (in some systems) 	<ul style="list-style-type: none"> • access to quality care when and where needed • information / knowledge acquisition • informed choice • self-care • emotional support 	<ul style="list-style-type: none"> • product innovation / development • marketing
Exemplar ICTs	<ul style="list-style-type: none"> • eReimbursement systems • eMarketing or other supports for monitoring and influencing supply and utilisation 	<ul style="list-style-type: none"> • HIS • PACs • HIN • ePrescription • home telehealth • EHRs • remote triage • etc. 	<ul style="list-style-type: none"> • eLearning • practice automation • ePrescription • clinical decision support systems (CDSS) • eConsultation • etc. 	<ul style="list-style-type: none"> • online health information • personal health devices and systems • ePHRs, personal health spaces • social media • eConsultation • telehealth 	<ul style="list-style-type: none"> • bioinformatics • eMarketing
Exemplar social impact issues	<ul style="list-style-type: none"> • increased capacity to influence supply / utilisation 	<ul style="list-style-type: none"> • <u>indirect</u>: efficiency gains leading to better quality services • <u>direct</u>: more integrated/joined-up care, reduced errors, new services etc. 	<ul style="list-style-type: none"> • <u>indirect</u>: efficiency gains leading to better quality services • <u>direct</u>: better clinical decisions, reduced errors etc. 	<ul style="list-style-type: none"> • empowered patients • better health / quality of life • possible negative impacts (on utilisation, outcomes..) 	<ul style="list-style-type: none"> • new (beneficial) products • increased capacity to influence supply / utilisation
				• doctor-patient relationship	
				• self-care and moving care to the home	

Even in this more circumscribed area, there are various ways that such applications can be classified, depending on the level of granularity desired and the social issues that are to be emphasised. Figure 3.1 presents an organisation of the target space in a manner which emphasizes the roles of both the formal or 'official' healthcare system and emerging informal or 'unofficial' system (especially the consumer/patient movements, driven both by individuals and organisations) in the provision of ICT-based health services to patients/consumers.

Figure 3.1: Schematic view of applications from consumer/patient perspective



Based on this, three main groups of application may be distinguished:

- **'Health on the web'**: encompassing the range of formal and informal health-related activities conducted by consumers/patients online, such as seeking health information, participating in peer support groups, interactive advice/consultation, etc.
- **ICT-based Care delivery**: especially ongoing/continuous remote care to the home (home telehealth and telecare); also remote consultation (episodic) and personal health care systems/devices
- **ICT support for various communications**: with or from (traditional) healthcare providers/professionals: for example, e-mail communication with own doctor/provider, eBooking, ePrescription, eReminders and other 'push' applications involving ICT-based delivery of targeted educational/health promotional materials.

Although these groupings are not entirely orthogonal, this way of organising the domain will be useful for the social impact analysis in Section 4. Other useful ways of organising/classifying the domain can also be found, for example, the classification of applications that ostensibly or actually support patient empowerment (Monteagudo and Gil, 2007) and the approach developed in a major review of the impact of eHealth on the quality and safety of healthcare for the NHS Connecting for Health Evaluation Programme in the UK (Car et al., 2008).

3.1 **Health on the web**

As mentioned above, this category focuses on the wide variety of formal and informal online health-related services and activities that have emerged in recent years. Two main 'generations' of applications can be loosely distinguished, mapping approximately to so-called 'Web 1.0' and 'Web 2.0' functionalities and usages.

Core patient/consumer activities of the **Health 1.0** era have revolved mainly around online ('read only') health information seeking, with more interactive online consultation or seeking of advice/diagnostic support also emerging although to a lesser extent. Online purchasing of medications has also become an important development, often operating in a 'grey' zone as regards regulatory control and legality.

The emergence of the **Health 2.0** era has heralded extensive growth in online user- (i.e. lay person) created content, peer support groups and other usages of social media for consumer/patient health purposes. Health 2.0 has been defined as the use of a specific set of web tools (blogs, Podcasts, tagging, search, wikis etc.) by actors in healthcare including doctors, patients and scientists, using principles of open source and generation by users, and the power of networks, in order to personalize healthcare, collaborate, and promote health education (Hughes et al., 2008). It also includes / overlaps with social media (California Healthcare Foundation, 2008) and the large number of virtual (self-help) support communities that are emerging in the healthcare area. The emerging range of applications also includes various personal health records (ePRs) and other types of online personal health spaces or organisers. The growing number of sites providing user ratings of quality of particular healthcare providers and services are another important development.

Supply

Although an exhaustive inventory of online health sites is not currently available, it is clear that there are many of thousands of such sites worldwide. Even as far back as 2001 it was estimated that there were 70,000 websites (Cline and Haynes, 2001) or around 2% of all websites (Powell and Clarke, 2002) that offered some form of health-related information. The majority are in the main languages (especially English).

At EU level, there is now an official 'Health 1.0' site for citizens¹. Across the EU Member States, the extent of 'official' provision of such sites varies and there does not seem to be any complete and up-to-date overview available. The EU-funded 'eUSER' research project provides a description of the patient/consumer oriented eHealth supply side in the (then) EU 25 in 2005².

Some illustrative examples of (English-language) Health 2.0 sites/services are presented in Table 3.2 below. There are many examples also in other countries/languages, for example in Germany³, France⁴ and Spain⁵.

¹ http://ec.europa.eu/health-eu/index_en.htm

² http://www.euser-eu.org/euser_countrybrief.asp?MenuID=83

³ e.g. klinik-lotse.de, tk-online.de, bkk-klinikfinder.de, klinik.de, aok-klinik-konsil.de

⁴ e.g. <http://forum.doctissimo.fr>

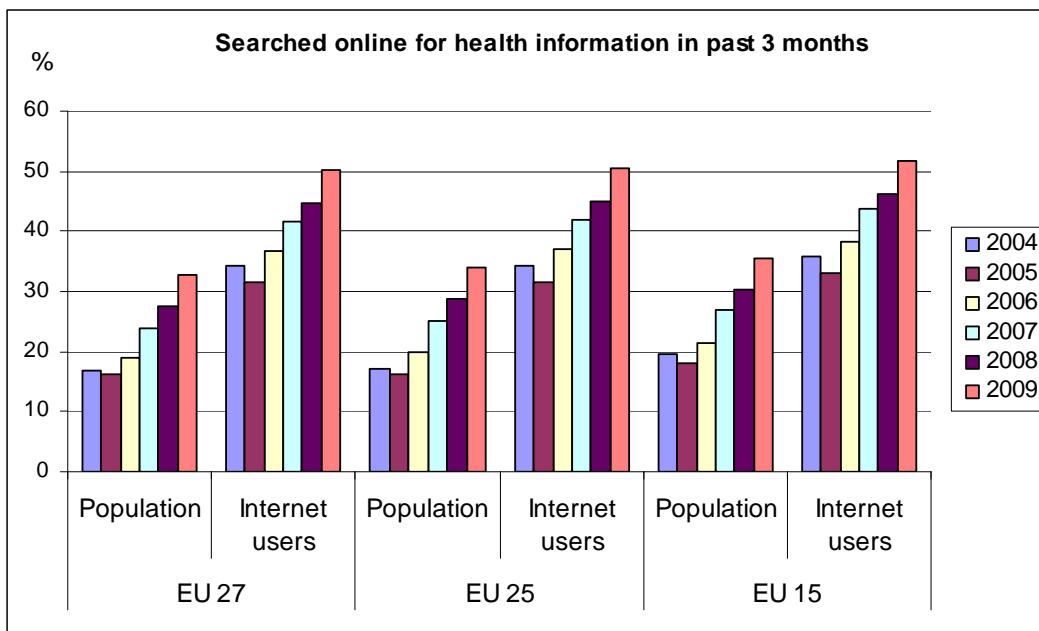
⁵ e.g. [http://www.prusalud.com](http://www.prsalud.com)

Table 3.2: Some examples of (English-language) Health 2.0 web sites

Wikis	FluWiki http://www.fluwiki.com/	Wiki on avian (and more recently, swine) flu, not intended to be a substitute for efforts by civil authorities, but as a parallel effort to complement, support and extend those efforts
Blogs	DiabetesMine http://www.diabetesmine.com/	Blog started by person recently diagnosed with diabetes to connect with others, to offset the feeling of isolation with diabetes, and to sort out and share information and experiences
Social networks / online communities	DailyStrength www.dailystrength.org	500+ support groups, 'wellness' blogs, treatment information etc.
	Patients Like me www.patientslikeme.com	Site for collecting and sharing real world, outcome-based patient data; for consumers/patients; also data-sharing partnerships with doctors, pharmaceutical and medical device companies, research organizations, and non-profits.
	MedHelp www.medhelp.org	Connects people with medical experts and others who have similar experiences; claims to have over 7.5 million users each month, who are helped to take control over their health and find answers to their medical questions
User ratings	Patient Opinion www.patientopinion.org.uk	Site where patients and carers can find out what other people think of local hospitals, hospices and mental health services; users share experiences / tell their story of the services used when ill
	RateMDs www.ratemds.com	Doctor ratings and reviews by consumers/patients
Personal health 'spaces', records...	HealthSpace www.healthspace.nhs.uk	Official, free, secure online personal health organiser available to all aged 16+ in the UK - helps to manage own health, store important health information securely, or find out about nearby NHS services
	HealthVault http://www.healthvault.com	Microsoft's personal health information management space and health information resource
Podcasts	dLife http://www.dlife.com/	Diabetes information / support site, provides podcasts for users
Multi-function	RevolutionHealth http://www.revolutionhealth.com/	User ratings (doctors, hospitals, drugs, treatments); personal health management tools and records; social networks/blogs; etc.

Demand / usage levels

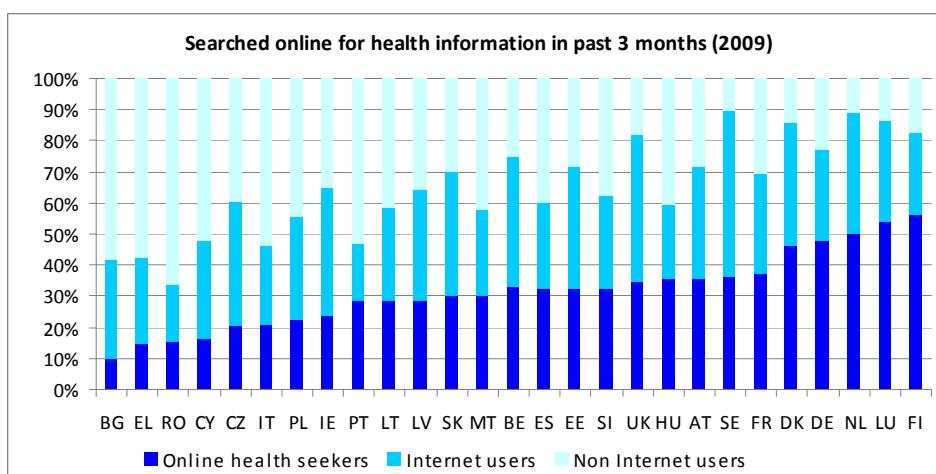
Data from Eurostat shows that usage of the Internet for health-related purposes (specifically, use of the Internet, in the last 3 months, for seeking health information on injury, disease or nutrition) by the general population has been growing steadily in Europe over the past number of years, as illustrated in annual data from 2003 to 2009 (Figure 3.2).

Figure 3.2 Trends in online searching for health information in the EU (2004-2009)

Data source: Eurostat Community surveys on ICT usage in households and by individuals 2004 - 2009

Growth can be observed both in the percentage of Internet users who have searched online for health information in the past three months and in the percentage of the overall population who have done so, reflecting both growth in Internet usage and in propensity of Internet users to search for health information online. For the EU15, for example, the percentages of the population searching online in 2008 was approximately 1.5 times greater than in 2004, with growth in Internet usage and growth in online searching for health information by Internet users making roughly equal contributions to this overall growth at the population level.

Overall, in 2009 almost one-third (32.7%) of the population in the EU27 had searched online for health information in the past 3 months. The situation in each Member State in 2009 is presented in Figure 3.3, showing wide variations across countries in terms of levels of usage amongst the population, from a low of just 9.8% in Bulgaria to over one-half (56.2%) of the population in Finland.

Figure 3.3: Country profiles in relation to searching online for health information (2009)

Data source: Eurostat Community survey on ICT usage in households and by individuals 2009

One issue that arises in relation to the Eurostat data concerns the particular indicator used - searching for health information online *in the past 3 months*. This 3-month reference frame has been widely utilized as an indicator of current usage of different types of Internet application/service in Eurostat and in other Information Society surveys. In the case of searching for health information, however, it is possible that such an indicator might significantly underestimate that actual extent of activity in the population. This is because, for many people, health information seeking is likely to be episodic, linked to irregularly occurring health episodes such as a particular health problem arising for oneself or one's family.

The two other European surveys – eUSER (eUSER, 2005) and eHealth Trends (Andreassen et al., 2007) – provide data on the numbers who ever have searched online for health information and, compared with Eurostat figures for the same years (2005 for eUSER and 2005 & 2007 for eHealth Trends), found considerably higher rates of online health searching amongst Internet users in the countries surveyed.⁶ Overall, these surveys found levels of ever searching online for health information per country that were on average, twice or even more than twice the levels for searching in the last 3 months that were found in Eurostat. When these rates are applied to the Eurostat figures for 2009 it can be estimated that more than one-half of the EU27 population has ever searched online for health information.

Results from recent US surveys suggest that levels of searching are somewhat higher in the US, with somewhere between 75% and 80% of Internet users (and about 66% of the population) having looked online for health information (PEW Internet & American Life surveys; Harris Interactive surveys). There is also some US data providing quantitative evidence for the growing importance of Health 2.0 sites, with one-third of those who looked for health information online reporting use of some form of social media / web 2.0 such as discussion forums, wikis etc.(iCrossing, 2008).

3.2 ICT-based Care delivery

This application category is concerned with the usage of ICTs in direct care delivery, as opposed to the more informational focus of the health-on-the-web applications discussed above. The main focus is on home telehealth / telecare, although some consideration is also given to (episodic) remote consultation and to personal (self-care) health systems / devices.

3.2.1 Home telehealth / telecare

This category of applications involves delivery of health and/or social care to the home on an ongoing/continuous basis. They are central components of what has sometimes been called 'eChronic care' (Monteagudo and Gil, 2007).

Home telehealth involves continuous (remote) monitoring of the health status and wellbeing of a patient at home, and may include subjective reporting of symptoms and/or objective measurement of various physiological parameters. It has a particular relevance for providing continuing care to people with chronic conditions (many of whom are older people) and is seeing growing application for conditions such as diabetes, chronic obstructive pulmonary disease and various cardiovascular diseases.

The term telecare is generally used to refer to remote social care and support for independent living for older people, with the focus on social rather than medical needs. Three 'generations' of telecare can be distinguished - first generation telecare (often called 'social alarms'), involving systems that enable older people to easily call for help in case of emergency; second generation telecare, involving additional home environment sensors that

⁶ CZ, DE, DK, FR, HU, IE, IT, PL, SI, UK in eUSER; DE, DK, EL, LV, NO, PL, PT in eHealth Trends

enable alerts to be triggered automatically; and third generation telecare, involving more extensive monitoring of activity and lifestyle. A core emphasis of telecare is on safety and security, in the context of a more general aim to enable older people to remain living independently in their own homes for as long as possible.

Supply

The available data indicate that first generation telecare is widely available in many European countries and is often well-integrated into the mainstream social care systems (<http://www.ict-ageing.eu>). More advanced telecare services are beginning to be deployed, but have yet to become mainstreamed in most countries.

Home telehealth has been talked about for some time but seems only recently to be on the verge of becoming mainstreamed as a part of regular healthcare service offerings and, even then, only in some countries and to a limited degree as of yet. In most countries, the numbers currently using home telehealth systems/services are still very low, with the most extensive implementations to date probably to be found in the US and Japan.

Demand / usage levels

Take-up of first generation telecare (social alarms) amongst older people varies quite widely across countries, ranging from less than 1% to more than 15% of people aged 65 years and older (<http://www.ict-ageing.eu>). As there are substantial variations across countries that have had social alarms quite readily available to older people for many years now, it seems that countries may differ in their 'saturation' points as regards the number of potential telecare users. This may suggest that the perceived role/contribution of telecare in the overall social care system may vary considerably across countries. More advanced telecare services are beginning to be deployed, notably in the UK, but have yet to become mainstreamed to any substantial degree in most countries.

As noted above, in most countries, the numbers currently using home telehealth systems/services are still very low, with the most extensive implementations to date probably to be found in the US and Japan. Perhaps the largest single deployment of home telehealth is that by the Veterans Administration in its CCHT programme, which had about 30,000 clients as of 2008 (Darkins et al., 2008).

3.2.2 Remote consultation

This category of applications concerns remote consultation on an episodic basis, as opposed to the more continuous monitoring associated with home telehealth. Two somewhat different forms can be considered - remote consultation with one's own doctor and (self-initiated) remote triage. In the case of triage services, the basic model involves a telephone-based call centre where trained personnel (typically nurses) answer calls from patients/consumers and used standardised (triage) protocols to assess their symptoms and give advice / make a referral as necessary. Such services may be provided as out-of-hours services for general practitioners or as more extensive, even national services (such as NHS Direct in the UK). Also falling partially within this category and partially within the 'health-on-the-web' category are online interactive advice/diagnostic services, which may be offered officially (as public services) or by a variety of other online players.

Supply

Although robust data on the extent of availability of the opportunity for remote (episodic) consultation with one's own doctor over the Internet ('eConsultation') is difficult to find, the available evidence suggests that this is still relatively uncommon. In Europe, as discussed in more detail in Section 3.2.3, the percentages of general practitioners having websites varies

widely across the EU Member States and, overall, only a very small percentage of general practitioners report having e-mail communications with their patients (empirica, 2008). More generally, the possibility even for phone-based consultation with one's doctor varies considerably across countries, both in terms of whether it is possible/encouraged and whether/how it is reimbursed (empirica and WRC, 2001). In the US, however, there appears to be a growing offering of so-called 'web visits', defined as an online consultation between a doctor and an established patient about a non-urgent healthcare matter⁷. Growth is being encouraged now that some health insurers offer reimbursement for such web visits (with the physician getting a somewhat smaller fee than for a face-to-face consultation and usually a co-payment charge for patients).

Telephone-based triage services providing out-of-hours cover for general practitioners are well established in some countries (e.g. UK, Netherlands, and Denmark) but do not seem to be a ubiquitous approach across Europe. In the UK, a nationwide service - NHS Direct - provides a 24/7 information/advice service, including triage. Interactive online advice/consultation services have also emerged. For example, the UK has implemented an online version of the service (NHS Direct Online) which can also be considered to be an example of an 'official' health-on-the-web application/service. Quite a number of other examples of interactive advice/consultation services can also be found (Monteagudo and Gil, 2007), such as 'Dokter' in The Netherlands (www.doctor.nl), Portal de Salud in Santander, Spain (www.santanderciudadviva.com/salud/), and 'VHI Healthcare Online in Ireland (www.vhi.ie). These may be offered by various players, including public health services, private healthcare companies, health insurers and so on.

Demand / usage levels

The available evidence suggests that the extent of electronic communications between patients and their own doctors remains relatively low both in Europe and the US. In Europe, in 2007 just 3.5% of general practitioners in the EU 27 overall reported using e-mail routinely for interactions with patients about health issues (empirica, 2008). The situation on the patient side mirrors this; for example, the eUSER survey in ten countries in 2005 found that only a very small percentage of the population reported e-mail consultation with their doctor compared with more than one-quarter reporting telephone consultations. Data from the US suggests somewhat higher but still low levels of doctor-patient communication by e-mail, with about 10% of Internet users reporting this in 2005 (HINTS, 2007). In general, in fact, it seems that there are higher levels of online interactions with doctors/health professionals than one has not met (16.8% of Internet users in the countries included in the eHealth Trends survey in 2007) than with a family doctor or other known health professional (9.7% of Internet users in the countries surveyed in 2007) (Kummervold et al., 2008).

Comprehensive data on levels of use of telephone (and online) triage services are difficult to find, although some indication of the scale of usage is provided by the eUSER survey of 2005 (eUSER, 2005) which found that across the surveyed countries just under ten per cent of respondents reported they had used a phone-based health advice service. Rates of reported usage were considerably higher in the UK than in the other countries, presumably reflecting the well-established national service (NHS Direct). Data from NHS Direct indicate a usage level of about 5 to 6 million calls per year over the past number of years⁸. Levels of usage of the online equivalent (NHS Direct Online) have grown dramatically and now total about 30 million visits per year. However, only a minority of these visits are for the online equivalent of 'triage' type services, with the majority looking at the various health information

⁷ <https://www.relayhealth.com/>

⁸ <https://newdesign.nhsdirect.nhs.uk/article.aspx?SectionId=2&Name=AnnualReport>

resources that are provided, that is, using the more traditional 'Health 1.0' type applications on the site.

3.2.3 Personal (self-care) health systems and devices

A growing variety of personal (self-care) health systems / devices have begun to emerge, some of which seem likely to become increasingly important in healthcare processes in the foreseeable future. One category concerns systems or devices that provide health management support to people in their own homes. These may be used in a standalone manner by users themselves or may be integrated into the types of home telehealth services mentioned above. Earlier there was also a particular interest in using home computers as a platform to deliver health behaviour-change interventions. In both cases, online services can sometimes provide similar functionality to that which can be provided via a specific home device.

Also relevant for this area are new classes of products such as those marketed as tools for developing or helping to maintain cognitive capacity as one grows older, with both mainstream consumer electronics devices and specially-designed systems being advertised for these purposes. Other assistive and enabling technologies are also relevant here, including electronic aids for people with visual, hearing and speech difficulties, smart home systems for people with mobility difficulties, and so on. Some of these may be considered to fall within the scope of the healthcare domain and some within social care, although in the future the boundaries between these domains will become increasingly blurred in the effort to address the chronic disease and other challenges posed by an ageing population.

Another important category concerns personal health records, whereby patients/consumers have their own online health record and/or organisational space to record health episodes and transactions, store information and, if desired, make this available to professionals and others. These tools can also be considered to fall within or overlap with the Health 2.0 applications discussed above.

Supply

Many (typically small-scale) projects and programmes have implemented ICT-delivered health interventions in a variety of fields, especially health behavioural change and mental health, initially via personal computers and more recently over the Internet. A wide array of personal, self-management health devices and services have also emerged in the marketplace, involving a variety of functions and delivery platforms (e.g. PDA/smartphone delivery of smoking cessation programmes; wearable blood pressure and heart rate monitors; electronic scales; portable medical records with alerts on allergies or other important aspects of medical history; and so on.). Some of the home/patient devices used in home telehealth programmes can also, at least in principle, have a self-management dimension and application. These types of device are now beginning to be deployed in home telehealth services on a relatively large scale in a number of countries.

Finally, a variety of forms of personal health organiser systems to manage one's health information and/or records (generically termed electronic Personal Health Records - ePHRs) are now beginning to be offered by a range of providers/vendors, including 'official' services (e.g. HealthSpace provided by the NHS in the UK) and services provided by other players (e.g. Microsoft's Health Vault).

Demand / usage levels

Comprehensive data is difficult to find in this field, at least in the public domain. Although current numbers of users can be expected to still be limited, industry experts predict rapid growth in this area.

3.3 ICT support for various healthcare communications

Section 3.2.2 looked at doctor-patient or nurse-patient communications that have a clinical dimension (e.g. phone, e-mail or other forms of online consultation with own doctor or through a triage service). Here the focus shifts to other types of healthcare communications between patients/consumers and healthcare providers, such as eAppointments/eBooking, ePrescriptions, eReminders and targeted health information / education communications to individuals.

Supply

The extent of provision of websites by General Practitioners varies widely across Europe (empirica, 2008), ranging from almost all (96%) in Finland to only a small minority in Latvia (7%). Sweden, Denmark, Netherlands, Slovenia and the UK also score relatively highly in this regard. It seems that in some countries, legal regulations relating to advertising or marketing are an inhibiting factor. In Germany, for example, the professional code of conduct requires that a doctor's a website may not be used for the advertisement of products or services offered by the practice.

As regards email interaction between general practitioners and their patients, the available data suggests that this is not commonly conducted by general practitioners in the majority of European countries (empirica, 2008). For the EU 27 overall, in 2007, just 4.1% of general practitioners reported using e-mail routinely for administrative interactions with patients and just 3.5% for health issues. The main exception was Denmark, where almost sixty percent of doctors reported both types of electronic communication with their patients.

Some countries have well-developed online services in other areas, such as booking appointments with hospital or clinic services. The *Choose and Book* service in the UK (<http://www.chooseandbook.nhs.uk/patients>) is a good example, designed to allow patients to choose a hospital or clinic and book an appointment with a specialist, once they and their GP agree that they need to see a specialist. Patients are to be able to choose from at least four hospitals or clinics, and to choose the date and time of their appointment.

Provision of ePrescription is also growing in Europe, although there is often not a direct ICT-based interface with the consumer/patient as such. ePrescription is well established in Denmark, Sweden and the Netherlands, where the majority of general practitioners report direct eMessaging of prescriptions to the pharmacy (empirica, 2008). Other modes of implementation can also be found. In Germany ePrescription can be implemented by means of the electronic health card - the prescribed data can be uploaded onto a chip in the card which can be read at the assigned pharmacy. In the UK, electronic prescriptions are being implemented in two phases. In the first phase, physicians issue a paper prescription containing a bar code which the patient brings to their pharmacy where it is scanned and the prescription is pulled down from the centralised NHS information system. The second phase will eliminate the use of paper in this process.

Provision of eReminder services is also becoming quite commonplace, especially appointment reminder systems based on phone, text messaging or e-mail. Medication reminders are also being implemented, although on a more limited basis to date. There has also been a growing provision of other forms of healthcare information/education 'push' services, such as Podcasts, SMS texting and so on, and also using Digital TV platforms.

Demand / usage levels

It seems that when such services are made available usage levels tend to be high, as evidenced In the UK, for example, where quite large numbers have already used the Choose and Book eBooking system. The numbers of ePrescriptions per year are also very large in the countries where this is a well-established mainstream feature of the healthcare system,

such as Denmark, Sweden and the Netherlands. In some countries, also, quite large numbers are being reached by eReminder services, mainly in relation to appointments. Available data (e.g. Monteagudo and Gil, 2007) suggest that the extent of penetration of other 'push' applications is patchier even if this is a growing area of application.

4 Social Impact Analysis

This section examines available evidence for social impacts of the applications discussed in Section 3. The focus of the analysis is in the main from the consumer/patient point of view. From this perspective, impacts (including benefits as well as possible dis-benefits) may be 'direct' or 'indirect'. Direct impacts may accrue to the individual as a result of using the application/service for themselves as well as from uses of ICTs by other players in the healthcare system in relation to their specific case (e.g. use of decision-support tools by one's doctor to aid diagnosis / treatment). Indirect impacts derive from wider impacts on the health system overall that lead to generalised impacts for many consumers/patients (e.g. efficiency gains leading to more time with patients rather than on administrative work). The main focus of the analysis in this section is on direct impacts, especially direct impacts that accrue to consumers/patients as users of ICTs themselves.

Even within this delimited context, 'social impacts' encompass a potentially very wide and diverse range of phenomena and outcomes. The focus of the analysis could be centred on social 'phenomena', such as the ways consumers/patients interact with other lay persons, health professionals and so on when dealing with health matters of concern for them. Alternatively, it could be centred on the health-related outcomes of such social phenomena. Or, it could be centred on issues of social equality/inequality as they arise in this sphere. Each of these perspectives is included in the analysis presented in this section, with the presentation and discussion organised in terms of the key dimensions indentified in the common conceptual framework that has been developed to guide the work in each of the domains being investigated in the project (Van Dijk, 2009). These core social impact dimensions are rationalisation (efficiency, effectiveness, and innovation), networking & social capital, empowerment & participation, and information & lifelong learning.

Table 4.1 presents an a priori mapping of the social impact dimensions to the main ICT-supported health applications that were identified in Section 3.

Table 4.1: Mapping social impact mechanisms to key consumer / patient facing applications

	'Health on the web'		ICT-supported Care delivery			ICT-support for healthcare communications	
	Health 1.0	Health 2.0	Remote consultation (episodic)	Telecare / home telehealth	Self-care systems / devices	Admin./ Transactions	Health promotion 'push'
Rationalisation	X	X	X	X	X	X	X
Networking	X	X	X	X		X	X
Social capital	X	X					
Empowerment & participation	X	X	X	X	X	X	X

Information & lifelong learning	X	X	X	X	X	X	X
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From this cursory, surface-level analysis the emergence of so-called Health 2.0 applications based on social media would appear to have the largest potential for social impact, with strong potential to affect the empowerment & participation, networking & social capital, and information & lifelong learning dimensions. The more basic information and transaction applications of Health 1.0 also are envisaged to have potentially strong impacts on the empowerment/participation and information/lifelong learning dimensions. Remote health and social care through telecare/home telehealth is envisaged as having the strongest rationalisation effects, at least as regards efficiency, given its potential to directly substitute home care for institutional care. Substantial efficiency benefits could also be expected, at least in principle, from more episodic remote consultation and from various transactional and other healthcare interactions/communications.

In reality, however, it is a very challenging task to robustly identify the social impacts in this field. One challenge comes from the sheer variety of ICT applications; even when the diversity is reduced through the type of classification system developed above, the range of applications and types of impacts is still very wide. There is also the challenge posed by the fact that many applications/services in this field are currently in 'perpetual beta', in the sense that they are continuously evolving and being shaped through experience by those who provide and use them. Linked to this is the interactive nature of ICT development and implementation, both with organizational and social environments – technologies have social consequences and social systems have technology consequences. ICTs in healthcare can thus be conceptualized as socio-technical systems (Coirera, 2004).

Another challenge comes from the absence of a single research field and literature to draw upon for purposes of a social impact assessment, with relevant research covering a spectrum ranging from clinical trials to the sociology of the Internet. In addition, a diversity of methodologies has been employed in research in the area, with a lot of variation in terms of rigorousness and robustness. Against this background, systematic reviews of the evidence are particularly useful. Quite a number of such reviews can be found, although not always mapping directly or neatly to the conceptual framework and classification of applications developed in this study.

Overall, the research to date in this field has been patchy and generally not organized within a framework that would support incremental evolution of the knowledge base. The following sections make a first effort to draw together some of the key findings and insights that can be discerned from the evidence that can be found. This is not intended as an exhaustive review but rather to provide an organized view of the nature of the current evidence-base in this field as it relates to the applications and conceptual framework of interest in this study.

4.1 Rationalization

According to the overall conceptual framework of the project, rationalisation impacts are to be found where ICTs influence the achievement of efficiency and effectiveness objectives of the domain. In addition, rationalisation encompasses innovative capacities introduced by ICTs, such as being able to do things that were previously not possible.

The rationalisation benefits from remote provision of health and social care through telecare/home telehealth are seen as having a major role to play in meeting the health and social care needs of the ageing population in Europe. This application area is thus given the most attention below. Each of the other application categories also offers some potential for rationalisation impacts, some more than others, and these are also briefly examined below.

4.1.1 Telecare / home telehealth

This application category concerns delivery of health and social care to the home on a continuous, ongoing basis, typically involving some combination of regular monitoring of the client/patient's condition and/or ongoing remote self-reporting or remote consultation with a doctor or nurse. Other forms of telemedicine, such as remote access to specialists from geographically isolated areas, although important for residents in such areas, are not directly considered in the analysis below.

The evidence-base for positive benefits

ICTs can have a truly innovative impact in this area as they enable healthcare to be provided on a remote and continuous (24/7) basis to the home which otherwise could not be envisaged without impossibly large investments of human resources and equipment in each individual case. In principle, it is seen as providing a 'win-win' solution to meeting needs posed by chronic illness and, especially, by the ageing of the population, so that both cost-savings for healthcare systems and quality benefits for patients can be simultaneously achieved. Indeed, at EU level, a 'win-win-win' scenario is being envisaged, whereby European industry can also gain substantial benefits through developing and selling the technologies that are needed to support this.

To begin with, it is worth recalling the assessment of the current status of the supply and demand/usage sides in this area, as presented in Section 3.2.1. There it was concluded that, apart from basic social alarms for older people, the extent of provision and take-up of more advanced telecare / home telehealth is still quite limited. Therefore, whatever impacts may be detected will only be accruing to relatively small numbers of people at the moment, even if it seems that much larger numbers are likely to be reached over the coming years.

Some recent efforts have been made to systematically review the evidence-base in this field (e.g. Litan, 2008; Barlow et al., 2007) although in general it seems to be quite difficult to come up with definitive conclusions about the impacts of telecare / home telehealth at this point in time. One problem is that much of the activity in this field to date has been relatively immature, with many small-scale trials and pilots that often do not lead to implementation of ongoing, mainstreamed services. Another problem has been that evaluations of impacts, when conducted at all, have often been quite limited in terms of scope and methods. It also seems that the evaluations that have been conducted have often been carried out by those directly involved and thus may lack the necessary objectivity.

One recent review of this field (Litan, 2008) looked especially at the economic benefits for the healthcare system but also examined various social and quality of life impacts for users/patients. Overall, the report concluded that the benefits of telemedicine, and in particular remote monitoring, are well-documented. Remote monitoring detects problems earlier, leading to better outcomes and less hospital time. The available evidence suggests special efficacy for patients with chronic ailments such as diabetes, congestive heart failure, chronic obstructive pulmonary disease and chronic skin ulcers, for which changes in vital signs can signal a need for medical intervention. Economic modelling by Litan suggested that a full embrace of remote monitoring could reduce health care expenditures in the US by a net of \$197 billion (in constant 2008 dollars) over the next 25 years.

The review identifies various benefits for patients that have been documented, including:

- reduced (or avoided) travel and waiting time
- avoiding delays in care
- access to care on a regular / continuous basis, whenever necessary
- possibility to get care outside of typical office hours
- sense of security for the patient

- enables proactive rather than reactive relationship between providers and patients
- enables care to be accessed in preferred / more pleasant environment
- reduction in both the incidence and duration of hospitalization for patients with chronic conditions.

For older people, the more practical and social supports provided by telecare appear also to yield benefits, including (Litan, 2008):

- being able to remain in their own homes (avoiding need to move to institutional care)
- helps to remain independent
- ongoing monitoring and identification of needs for early intervention to prevent irrevocable decline in capacity to manage for oneself
- source of security (e.g. for those who live alone)
- reduction of burden (and anxiety) for family carers, including enabling combining of paid employment and care
- reduced costs of care (for older people and their families).

A review by Barlow et al (2007) focused on home telecare/telehealth for elderly patients suffering from chronic diseases, including diabetes, heart failure, cognitive impairment (dementia and/or Alzheimer's disease), chronic obstructive pulmonary disease, chronic wounds and mobility disabilities. The authors conclude that results overall have suggested that patients are generally satisfied with this form of service delivery, although the majority would prefer a combination of home telecare/telehealth with conventional health-care delivery. The healthcare professionals involved have also seemed to be generally positive. In practical terms, users have commonly reported that telecare/telehealth leads to a reduction in costs due to time savings and avoidance of travelling. Nevertheless, although the reviewers concluded that the results indicated important benefits from home telecare/telehealth, they also pointed to substantial organizational, ethical, legal, design, usability and other matters that need to be resolved before widespread implementation can occur.

Barriers to mainstreaming of service innovations such as telecare and home telehealth have also been addressed in a benchmarking study of 16 countries (<http://www.ict-ageing.eu>). These include a range of cultural, organisational and other systemic factors. One important source of blockage comes from provider and/or practitioner reimbursement systems that disincentivise rather than incentivise deployment of innovations like home telehealth. In addition, it seems that professional resistance to change as well as lack of organisational willingness/capacity to change and innovate may also be important barriers in this field.

Ethical concerns raise a cautionary note

Other analyses have looked at the possible downsides of the rationalisation benefits that can be provided by telecare / home telehealth, particularly when examined through an 'ethical' lens (<http://www.ict-ageing.eu>). There are important social and ethical issues that arise in this area, such as maintenance of privacy and dignity when implementing applications involving surveillance of the home and/or lifestyle monitoring. Overarching issues around how much emphasis should be given to technology-supported care in the search for solutions to the long-term care challenges posed by demographic ageing and about the implications of these applications for the sharing of caring responsibilities between formal care services and the family also need to be addressed.

Considerations of 'distributive ethics' across the (target) population as a whole arise here as well. At the risk of crude over-simplification, distributive issues are about equality of access to preferred/higher quality services (whether these be human or ICT-based) and avoidance of a situation where those who are economically or otherwise disadvantaged have no choice

but to avail of less preferred/lower quality services (whether human or ICT-based). The extent of fairness in the overall care systems in a country or administrative region will exert an overarching influence on this, of course, and across Europe systems vary widely in the extent of universality, equality and so on. The nature of the public-private mix, how different groups in the population are covered and the equality implications of this are important elements here, as discussed, for example, in an analysis conducted for the Council of Public Health and Healthcare in the Netherlands (Health Council of the Netherlands, 2004). Transparency as regards the motivations (quality of care, cost savings or profit) behind the offering of new services such as telecare or home telehealth is a key ethical requirement in this regard.

An important ethical dimension linked to this relates to the intended and/or actual impact in terms of the distribution of the burden of care between the formal services and the family (i.e. informal carers). In the case of home telehealth, for example, questions have been raised about the appropriateness and/or fairness of expecting family members to provide new health-related types of care. More generally, concerns have been raised around the bringing of healthcare into the home and the associated risk of 'medicalization' of the home. As regards telecare, the evidence shows considerable variation across Europe in the extent to which telecare services rely on family or formal care services to provide the response when an older person needs help. There are also specific and important issues related to the monitoring and surveillance elements of telecare, raising issues of informed consent, transparency, proportionality, purposefulness, privacy, and personal and family dignity.

4.1.2 Other applications

Care delivery

Remote consultation

As noted in section 3.2.2, the extent of availability and usage of eConsultation between patients and their own doctors seems still to be very limited. There is thus little in the way of evidence of any substantial social impacts from this type of application. However, there have been various assessments and evaluations of telephone triage as well as some more limited attention to online variants of triage.

A 'Cochrane Review' of this field (Bunn et al., 2004) concluded that telephone consultation appears to be safe and that people were just as satisfied using the telephone as going to see someone face-to-face. Results also showed that, in general, at least half of the calls were handled by telephone only (without the need for face-to-face visits) and that, overall, telephone consultation appears to decrease the number of immediate visits to doctors and does not appear to increase visits to emergency departments, although from the available evidence it was unclear whether this is just delaying visits to a later time. The review also concluded that questions remain about its effectiveness and that more research into the use, cost, safety and satisfaction of telephone consultation is needed. A Canadian review (Stacey et al., 2003) came to similar conclusions - about 50% of calls to teletriage services could be managed without having to refer the caller elsewhere and teletriage reduces the number of immediate visits to physicians without causing adverse outcomes such as subsequent hospitalizations, visits to emergency departments or even deaths.

There appear to have been just a small number of assessments of web-based triage and other interactive online advice/consultation services, as of yet. A relatively small-scale pilot study of a clinical enquiry service on the NHS Direct Online (online equivalent of the NHS Direct) in the UK (Emonivic et al., 2004) concluded that it was sufficiently safe to continue piloting, but in order to make further judgments about safety, more tests with urgent cases would need to be performed. It was found that Web chat sessions can be quite long and may be too expensive to be sustainable. Reactions from patients were positive and the

service was seen as having potential for specific patient groups (such as deaf people and those who are shy or socially isolated). In another study, initial evaluation showed high use and good accuracy of a web-based triage service for college students (Sole et al., 2006). A Swedish survey of users of a non-commercial, web-based 'Ask the Doctor' service also found positive user evaluations ((Umfjord et al., 2006).

CDSS

Clinical decision support systems (CDSS) can also be briefly mentioned here. Although such systems are designed for use by doctors they have a direct relevance for patients as they may influence the clinical decisions made and, ultimately, health outcomes.

An early systematic review of computer-based systems found that most (about two-thirds) significantly improved clinical practice, but about one-third did not (Hunt et al., 1998). A more recent review of a range of decision support systems, computerised and not, had similar results, with significantly improved clinical practice found in about two-thirds of trials (Kawamoto et al., 2005). Four key factors were found to be independent predictors of system success - automatic provision of decision support as part of clinician workflow, provision of recommendations rather than just assessments, provision of decision support at the time and location of decision making, and computer-based decision support.

Personal / self-care devices

Systematic reviews of early computer-based interventions to support applications such as health behaviour change (e.g. Revere and Dunbar, 2001; Murray et al., 2005) have suggested that they can be at least moderately effective, although the research has also been the subject of some controversy (Eysenbach and Kummervold, 2005).

Schlenk (2009) conducted a systematic review of medication adherence interventions involving a variety of memory aids and cues, some with telecommunications links and others that were more standalone, such as time-specific blister packs, voice-activated messages and automatic dispensers. It was concluded that the majority of studies showed that the interventions using memory aids and cues, some in conjunction with newer technologies, improved adherence.

Overall, however, there seems so far to be little in the way of social impact evidence for some of the key emerging trends in this area, such as the various forms of personal health records (ePHRs) and the types of home health management devices being developed for implementation in home telehealth services but also with a likely future orientation towards standalone usage and the mass consumer market by some of the large players. In the case of ePHRs, a review of the field (Kaelber et al., 2008) found that take-up levels by patients who have been offered such systems seems to date to have been lower than might have been expected on the basis of apparent interest. In addition, when such systems are used they may not always be used effectively, indicating that consumer/patient education may be important if the potential benefits are to be realised.

More generally, the growth of personal health devices has raised concerns about the possibility of creating a new category of 'worried well' people (Council of Public Health and Healthcare, 2004). This concerns the possible 'medicalisation' of people who do not have a medical problem and whether this is a desirable trend. A similar concern has arisen in relation to health information on the web (the concern about the emergence of so-called 'cyberchondria') and this is discussed in more detail in Section 4.4.

Health-on-the-web

Self-directed health information seeking on the web has the potential to have rationalisation impacts in both positive (e.g. through better informed patients making more efficient use of

health services or taking better care of their health and thus reducing costs and improving health outcomes) and negative ways (e.g. if online experiences encourage more usage/less efficient usage of health services or the taking of inappropriate actions that might have negative health consequences as well as possibly increased costs). These possibilities are addressed in more detail in the context of the 'information' dimension in section 4.4.

ICT-supported health-related communications and transactions

Administrative/Transactional applications

Although the nature of applications such as ePrescription, eReminders, eAppointments and eBookings would seem to suggest a likelihood of positive rationalisation benefits for patients/consumers, as of yet there seems to have been relatively little research on their actual impacts in practice.

As regards ePrescribing, evaluations of nationwide electronification of the prescription processes in countries such as Sweden and Denmark have shown very positive impacts. In Sweden, for example, more than two million electronic prescriptions are transmitted every month, and a national mail box for electronic prescriptions allows patients to choose any pharmacy in the country and pick up their medication by identifying themselves at the counter. Patients may also store their prescriptions electronically for future repeat prescriptions. New legislation allows patients to access a national database of their medication history over the last fifteen months, and they may also give consent to prescribers and pharmacists to search online the pharmacy register of dispensed medications to enable increased quality in any future prescribing and dispensing. Although the process of ePrescribing has clear efficiency benefits for patients, as well as for prescribers and pharmacists, evidence of impacts on effectiveness/quality/safety issues seems limited to date (Bengt et al., 2009).

More generally, a systematic review of the field has been recently conducted as part of the UK's NHS Connecting for Health Evaluation Programme (Imperial College, 2008). This report addresses broader issues around ePrescription focusing not just on efficiency aspects but also on additional clinical support functionalities that are being added to some systems. The background to this is the considerable variation in the quality of prescribing that has been documented, as well as the fact that medicines management errors are common, costly and an important source of iatrogenic harm. ePrescribing is seen as having the potential to greatly improve the quality and safety of prescribing, through facilitating cost-conscious evidence-based prescribing and, in particular, through reducing errors associated with knowledge gaps, as well as supporting routine tasks such as repeat prescribing and the more mundane but very important issue of errors due to legibility problems with written prescriptions. In practice, review of evidence on ePrescribing systems is made difficult because currently implemented systems are highly variable in functionality, configurability and the extent to which they integrate with other systems. Nevertheless, the review found moderate evidence that practitioner performance is improved through ePrescribing but that patient outcomes have been less well studied. When the latter have been assessed, most studies seem not yet to have been able to demonstrate a clinical benefit.

There seems to have been little in the way of systematic review of the benefits/impacts for consumers/patients of eBooking of healthcare services for patients. However, a large-scale survey of users of online public services across Europe, conducted in 2004, found that average time savings of 74 minutes per transaction were reported from use of online health related services, which was amongst the highest levels of time saving across the various public service domains that were included (Ramboll Management, (2004)). Apart from the intrinsic value of such time savings in themselves, they can also be monetised using accepted formulae based on average hourly earnings or some other such yardstick. Given the growing usage of the Internet for health-related informational and transactional services,

the aggregate economic value of time saved across Europe can be estimated to be very substantial.

Health-related applications via 'push' technologies

These applications involve messaging to the consumer/patient. eReminders are one important example of such 'push' applications, including routine reminders about a forthcoming doctor or clinic appointment as well as more proactive ones reminding about vaccinations, check-ups and so on.

Failure to attend appointments or to take-up particular procedures (such as vaccinations or health checks) are important problems for the effectiveness and efficiency of health services, as well as posing potential threats to people's health. There have been various studies on the impact of healthcare appointment reminder systems, including reminders about attendance at GP or hospital outpatient appointments as well as reminders about uptake of specific procedures such as vaccinations. For vaccination behaviour, for example, a review of the evidence by Jacobson et al (2005) found that reminders increased the number of people vaccinated, with this being observed in both children and adults for all types of vaccines, although not among urban adolescents in one study. Telephone reminders were more effective than postcard or letter reminders, although this may sometimes be more expensive compared with alternative approaches.

A regards the role of ICTs in delivery of reminders (eReminders), there has been a growing interest especially in text-messaging to mobile phones. A systematic review of use of text-messaging reminders (Rifat et al., 2005) found that quite a number of such programmes internationally have reported success or benefits, including positive patient experience and a reduction in the number of patients that did not attend (DNA) appointments, although not necessarily with the support of scientifically designed studies to confirm these assessments. Some studies have also suggested the possibility of adverse consequences, however, such as patients who receive text-message reminders tending to ignore subsequent paper-based communication, including those providing instructions to prepare for diagnostic investigations or therapeutic interventions. In some countries, such as the UK, there have also been concerns regarding possible compromise of patient confidentiality.

In addition, there has been some questioning of possibly adverse impact on equity, although the relative ubiquity of mobile phones across socioeconomic groups may mitigate against this. A study from Australia (Stott, 2008) found that the proportion of appointments which young people failed to attend was approximately halved if they had received a text-message reminder and that marginalised young people, in particular, were more likely to attend, reschedule or cancel their appointment if they received a text reminder than if they did not. This is an illustration of the particular potential of mobile phones to reach (and influence) a very wide spectrum across the population and thus its potential to help reduce 'eHealth divides' in the population (e.g. Fox, 2008), as discussed further in Section 4.3.

Reminders about medical compliance also have relevance for this category of applications. The health consequences of medication non-adherence can be severe, including disease complications or progression as well as untoward side effects from taking medicine incorrectly. Compliance can be a particular challenge for older adults who often must self-manage complex medication regimens for multiple chronic disorders. Estimated annual costs of medication non-adherence in the US are enormous (e.g. DiMatteo, 2004). A systematic review of the use of text-message reminders in this field (Rifat et al., 2005) found that it has been used to prompt patients with a wide range of conditions, such as acne, asthma, diabetes, tuberculosis, and AIDS, as well as to remind teenagers to take their contraceptive medication and other patients to fill repeat prescriptions. Factors linked to success have included design to retain user interest and avoid desensitization (e.g. where a person will receive many messages due to having a long-term condition), explanation of benefits at start of a scheme, personalized messages, different text messages each day,

mixing reminders with alerts, jokes, and provision of lifestyle tips. Success in reaching difficult to influence groups has also been reported, such as teenagers in the UK living in high risk areas for teenage pregnancy and for patients with tuberculosis and TB in South Africa. Most of the evidence comes from the grey literature, however, although results of the small number of clinical research studies that have been published in peer reviewed journals have generally tended to support a positive impact on adherence (Rifat et al., 2005).

Uses of text-messaging in public health programmes have also been reviewed (Rifat et al., 2005), including contact tracing and partner notification for communicable diseases, rapid communication of health information to the general public in case of epidemic, and for programmes such as smoking cessation. Various beneficial impacts have been reported, although again peer reviewed clinical research seems still be limited in relation to these applications. Krishna et al (2009) also reviewed empirical evidence on cell phone and text messaging used in a variety of health interventions and report that significant improvements were observed in the majority of the studies reviewed.

4.1.3 Synthesis and conclusions

The possibility of substantial beneficial rationalisation impacts seems more straightforward for some applications than others. Uses of ICTs to support health promotion 'push', remote consultation (especially triage) and various online administrative/transactional applications appear to be yielding efficiency and effectiveness benefits for patients/consumers as well as for health providers. Although telecare and home telehealth also appear to offer considerable promise for a 'win-win' in terms of benefits for clients and for the healthcare system (or even 'win-win-win', with market benefits for various ICT industry sectors as well), important social and ethical concerns have been raised. In addition, organisational, cultural and other systemic features of health and social care systems seem to have been limiting factors in their deployment to date.

4.2 Networking & Social Capital

Social networks affect health through a variety of mechanisms (Berkman & Glass 2000), including provision of social *support* (both perceived and actual), social *influence* (e.g. norms, social control), social *engagement*, person-to-person *contacts* (e.g. pathogen exposure, second-hand cigarette smoke), and access to *resources* (e.g. money, jobs, information). For our purposes, and following the dimensions of the project's overall conceptual framework, it is useful to separate theory and research addressing social **networks**, in themselves, from that examining the practical/social **support** provided by social networks. In this section, the former are addressed under the sub-heading 'networking' and the latter under the sub-heading 'social capital'.

4.2.1 Networking

In the project's conceptual framework, networking impacts are those that relate to changes in the patterns of links and communications that occur or are enabled as a result of ICTs. From the immediate patient/consumer point of view, health-on-the-web and especially the emergence of Health 2.0 seems to be the most significant development in terms of potential networking impacts and is thus given most attention below. Most if not all of the other applications also have at least some element of networking impact, and these are given some (briefer) attention as well.

Health-on-the-web

Networking developments

In the health-on-the-web domain, there seems to have been little direct research on networking developments, per se. Nevertheless, the more general evidence clearly indicates that the Internet and web has resulted in substantial extension of the links and connections that Internet users have in regard to health matters.

Before the emergence and explosive growth of health-on-the-web, the typical health-related 'network' of an individual/patient was generally quite limited. Regular formal links might include registration and attendance with a general practitioner and, in many countries, with a health insurer. Regular informal links might involve family members (mothers typically providing the health manager role in most families with children) and, for some, attendance at meetings of self-help groups. The web has radically transformed this situation in a number of ways.

One transformation has been extension of the 'reach' of the typical patient/consumer, so that in principle they can now engage (online) with a much wider range of parties, including a broad range of 'official' and 'unofficial' information and service providers, communities of interest (e.g. linked to specific diseases or conditions) and the wide global community of patients/consumers that can, in principle, be linked with and communicated with online. The growth of a myriad of online sites providing information and support for a wide range of conditions can be considered a manifestation of the so-called 'long tail' of Internet-based products and services, whereby there is increasing diversification and emergence of niche services and supports for even the rarest of illnesses and conditions.

Another transformation has been extension of the numbers and types of players that engage in healthcare-related activity and the emergence of a wide variety of new players, including commercial service providers, online support groups and online individuals. The web has provided anyone who wishes it to have a 'voice' and very many 'lay' individuals are now putting forward their health-related opinions and experiences.

Thus, from the individual perspective, health-related networks are extended both in terms of the range/numbers that can sourced for information/support and the range/numbers that can be reached/influenced by those who take a more active role in the provision of content.

Social media (Health 2.0) add a new networking dimension through the provision of specific tools that enhance social networking in relation to health matters – wikis enable collective compilation of content, blogs and twitter enable individuals to post their experiences for all to see. Another important development is the way that the web can help place new players at the hub of informational and support networks in the health field. For example, existing patient organisations and support groups can massively increase their reach, range of services and impacts.

Importantly, also, Health 2.0 in particular is beginning to herald the emergence of totally new types of collaborative networks, even if they have yet to fully evolve and become commonplace. As mentioned earlier, examples can be found of spaces where doctors, patients and other players (e.g. pharmaceutical companies, insurers) can come together to share experiences and interact in new ways. It has been suggested that such spaces could provide totally new possibilities for data aggregation, knowledge gaining and sharing, clinical trials, new product development, gathering information about market interests/preferences, and so on. Platforms that make health consumers and clinicians peers – open source healthcare - are also emerging (e.g. AmericanWell) and some payers now reimburse for such consults.

On the other hand, of course, concerns have been raised about the possibilities for new and more pervasive marketing or other influences by vested interests. This introduces also the

power of the web to facilitate rapid spread of messages across a wide audience. For example, US research has suggested that the average person can share health information with a 50-person network within 30 days (cited in Mack, 2009).

More generally, it has been suggested by many commentators that social media offer the potential for supporting and capturing the 'wisdom of crowds'. Some at least partially relevant examples have already been highlighted, such as the AthenaHealth online insurance rules engine that gets better as more clinicians use it and the MedBillmanager service that gets more robust as consumers enter real pricing. Collection of epidemiological information in new ways is another emerging possibility where the networking and reach of the web offers considerable potential.

Evidence of impacts

As mentioned already, there appears to have been little direct research on the impacts of health-on-the-web on the networking dimension, per se. Few studies have directly examined the impacts of health-on-the-web specifically from the point of view of the number / types of health-related connections that individual patients/consumers are making. Nevertheless, the analysis of the supply sides and demand sides presented in section 3.1 clearly indicates the extensive networking impacts that are arising both in terms of the dramatically increased range and number of players/parties that can now be reached and in the numbers of people who are connecting with these.

One general piece of evidence of the extension of reach comes from the fact that people typically look at more than one site when looking for health information. Surveys in the US have found that about three-quarters of online health seekers visited two or more sites during their last health information session (Fox, 2006). Another piece of relevant evidence is that, in the US at least, people connect to different types of sites for different types of information and support purposes (iCrossing, 2008).

Emerging patterns of influence in the new networked environment are an important impact dimension. US research suggests that there are already millions of active content contributors amongst the rapidly growing Health 2.0 community in that country (Manhattan Research, 2008). There has been relatively little research on the characteristics of those who are active contributors and not just passive consumers of health information online. One study of medical bloggers (Kovic et al., 2008) suggested a variety of motivations, including sharing practical knowledge / skills, influencing the ways others think, and expressing one-self creatively. Overall, however, there is very little evidence available on either the quality of the information being provided by medical bloggers or on the impacts of such blogs on the health-related activities and experiences of those who read them.

There seems to have been little in the way of direct research on the possibility of increased influence by more organised vested interests, such as pharmaceutical companies. However, there is evidence of growing attention to Health 2.0 in market research. For example, pharma industry analysis reports are beginning to put this onto the agenda of the sector (e.g. Manhattan Research, 2008) as well as pointing to the need for pharmaceutical companies to become more patient-centric in this regard (Anglemar, 2009).

Finally, there is emerging anecdotal and other evidence of new insights/breakthroughs coming from the radically enhanced networking potentials offered by the Internet, where doctors/researchers have been alerted to things that might not otherwise have come to their attention. Another interesting development is the potential for new epidemiological tools, such as detecting influenza epidemics using search engine query data (Ginsberg et al., 2009).

Other applications

Most if not all of the other applications have networking impacts to some degree. ICT-supported healthcare communications, both administrative/transactional and 'push', provide new channels for reaching and being reached by healthcare providers and by healthcare messages. Use of mobile technologies provides opportunities to bring more people into the network of those who are engaged within public health initiatives. Remote consultation services (by phone or online) extend the patient-doctor networks of consumers/patients beyond the traditional dyad of a single GP-patient relationship.

Perhaps of most interest are the networking impacts that can be associated with telecare/home telehealth. In the case of home support for older people through telecare, for example, the typical model involves a call centre monitoring requirements for assistance and, when an alert comes in, informing one or more pre-specified parties of the need for a response (i.e. a visit to the person in need of help). In many cases, family members are the defined parties to be called in case of a need for a response and thus telecare systems have the effect of formalising the informal carer role in new ways.

4.2.2 Social capital

This project's conceptual framework defines social capital as "*..the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit*". Three types of social capital have been distinguished (Woolcock, 2001) and are considered in the analysis of the health domain in this section – bonding (strong ties between like people/organisations in similar situations); bridging (more distant or weak ties of like persons/organisations); and linking (weak ties which reach out to unlike people/organisations, such as those entirely outside the community or in a different sector).

It is now well established through socio-medical research that social support has a major impact on health experiences and outcomes. These impacts are not just psychological, although these are very important in their own right, and a variety of physiological mechanisms have also been identified. The size and nature of the social capital that one can draw upon when confronted with illness can thus be expected to be an important factor for health.

In the health domain the social capital dimension has traditionally been especially in the form of information, help and support from family and friends in relation to health matters, and thus mainly of the **bonding** type. At least three dimensions can be mentioned here - provision of emotional support, asking family or friends for information and advice, and family members (especially mothers/wives) playing a central role in children's/family's health management. Support of a **bridging** nature has traditionally been provided by patient/self-help support groups, and there are large numbers of (disease-specific) ones in many countries. Logistical factors (such as geographical proximity of a relevant support group) have historically been a limiting factor in participation, but ICT-based support services can now help overcome such barriers. Based on similar logistical factors, it would seem that any substantial development of **linking** social capital in this domain would be dependent on ICT-based networking.

In our analysis, therefore, social capital impacts are seen as being especially linked to health-on-the-web developments. As already noted in the section on 'networking', these provide new opportunities to extend the size and range of socially supportive contacts to be drawn upon for informational and emotional support in relation to health matters.

Health-on-the-web

One basic if somewhat superficial way to begin to examine the social capital dimension of health-on-the-web is to look at how online health sources are trusted in comparison to other

more traditional sources such as one's doctor and one's family and friends. In fact, the evidence from a US survey suggests that one's own doctor remains by far the most trusted source of health information, being rated high on trust by more than three-quarters of those who use the Internet to look for health information (iCrossing, 2008). Although rated a lot lower than doctors, the Internet was rated somewhat higher on trust than relatives/friends/co-workers. This does not necessarily signify any erosion of traditional health-related social capital from family and friends, of course. People may still very much rely on family/friends for social and other forms of support in health matters, even if the evidence suggests that the Internet may tend to be seen as a somewhat more reliable source of factual information.

Family and friends

Although health-on-the-web applications offer particular potential for extending social links (and any associated sources of social capital) beyond the immediate, proximate networks of family and friends, one aspect of relevance for bonding social capital is the fact that many people use the web to search for health information on behalf of someone else. In the US, for example, almost one-half of searches conducted by health seekers were on behalf of someone else, such as a family member or friend (Fox, 2006). In addition, a US study on the role of the Internet in how people deal with major life decisions found that one-quarter of all who reported having helped another person with a major illness or medical condition in the past two years said that the Internet had played either a crucial or important role in this (Horrigan and Rainie, 2006). More generally, of course, to the extent that the Internet enables distant family members to keep in touch it can also be expected to contribute in a practical manner to bringing bonding social capital to bear when a family member has a health problem.

Communities of interest

In terms of social capital, the emergence of online support groups as a source of bridging social capital offers perhaps the most significant possibilities for major social impact. Such support groups involve mutual support and information provision from those affected by a common problem (Potts, 2005). As shown in Section 3.1, the evidence indicates that there are now a very large number of these groups, supported by a variety of web 2.0 and other social media, and the level of usage of such sites for health information and support-seeking is quite extensive. This means that any concrete impacts on social capital that can be detected are likely to be being already quite widely experienced.

However, it seems that so far only a limited amount of research attention has been given to the impacts of these online communities. Eysenbach et al (2004) conducted a systematic review of the effects of online peer to peer interactions through health related virtual communities and electronic support groups. They concluded that most studies did not show an effect and that there existed no robust evidence of benefits of consumer-led peer-to-peer communities, partly because most peer-to-peer communities have been evaluated only in conjunction with more complex interventions or involvement with health professionals. On the other hand, no evidence was found to support concerns that virtual communities might result in harm for users. It was concluded that further research is required to evaluate under which conditions and for whom electronic support groups are effective and how effectiveness in delivering social support electronically can be maximised.

Another review focused on online cancer support groups (Klemm et al., 2003). Although almost all of the reviewed studies purported to show that online cancer support groups helped people cope more effectively with their disease, the reviewers concluded that methodological limitations generally limit the applicability/transferability of results.

Similar conclusions have been drawn from a review of the evidence in relation to telephone peer support services (Dale et al., 2008). This concluded that the available research provides some evidence of efficacy (e.g. increased mammography screening in women over

40 years, helping patients change their diet and cease smoking after a heart attack, and reduced depressive symptoms among mothers with postnatal depression). Again, however, it was noted that few of the studies were of high quality and so results should be interpreted cautiously. Nevertheless, some comparative studies suggest that internet/phone-based interventions (e.g. for diabetes patients) may have promising potential (e.g. Van Damm, et al (2005)).

Linking social capital

The section on networking discussed some new forms of collaborative online networking that are emerging in the health arena, bringing patients, doctors and other players (including payers, researchers and the pharmaceutical sector) together in new ways. The extent to which this will result in linking-type social capital for consumers/patients remains to be seen as there is as of yet very little documentation of either the experiences or the outcomes for consumers/patients.

Other applications

The social capital dimension is not very prominent for the other ICT applications in our classification and is not examined further here.

4.2.3 Synthesis and conclusions

Overall, the networking trends driven by health-on-the-web to date seem to be towards greater diversity and decentralisation, in the sense that ICTs are extending the size and range of healthcare-related networks available to and being availed of by consumers/patients. This 'long tail' dimension enables people with even very rare conditions to find information and support online. Some networking developments (especially associated with Health 2.0, underpinned by social media) seem to bring the possibilities for new forms of influence, whether by individuals or by vested interests, and the social and health implications of this warrant further investigation and monitoring. Some developments, such as telecare, can encompass a formalization of previously informal networks (e.g. in the context of family care for older people) through codification of roles and responsibilities within a socio-technical system.

There are now a very large number of health support groups operating online and large numbers of consumers/patients are participating in these. Participants are clearly gaining social benefits and, although direct evidence is still very limited, it is possible that such groups may be providing the type of social support that socio-medical research has found to play a major role in positive health experiences and outcomes more generally. Further research would be useful in order to assess the extent to which virtual support can also deliver the positive health impacts that have been found for more traditional forms of social support.

4.3 Empowerment and participation

According to the project's conceptual framework, the central issue here concerns whether the impact of ICTs tends more towards centralisation (reinforcement of existing or emergence of new centres of power/control) or decentralisation (such that individuals have more choice, control, influence and so on). A useful discussion of the concept of patient empowerment in healthcare is provided in Monteagudo and Gil (2007). They note that the patient empowerment discourse is based on a number of assumptions including the idea that patients want to be in control of their healthcare and that such control will yield benefits for patients. It also is predicated on the willingness of healthcare providers to support patient control of their healthcare. More generally, it is widely assumed that information empowers

patients and that informed and empowered patients take better care of their health. These are assumptions that require critical analysis.

More generally, empowerment in the health domain can be viewed either from the system perspective or from the consumer/patient perspective. The extent to which these perspectives are complementary or contradictory may vary considerably across the different healthcare systems in different countries and also across different players and components of the healthcare systems within a given country.

From the healthcare system perspective, empowerment is about encouragement of citizens to take an active part in their own health management in order to support system goals of cost reduction, outcome improvement, or some combination of the two. From the consumer/patient perspective, empowerment is about control and choice in matters regarding one's own or one's family's health. Empowerment from the patient perspective involves issues around the distribution of power between those who use and those who provide healthcare services. The nature of the doctor-patient relationship and the balance of power and influence between patients and doctors is one key aspect of this.

For purposes of the analysis in this section it is useful to make distinctions between empowerment of citizens as healthcare *consumers* (where the concern is with issues such as choice of services), as *patients* (where the concern is with issues around influence in the doctor-patient relationship) and as *self-directed self-managers* of their own health (where the concern is with issues around having the necessary information, degrees of freedom and other prerequisites to be able to do this effectively). In fact, these roles may overlap or be blurred in various ways, and the term consumer/patient empowerment will be used in the analysis that follows in this section even if the consumer, patient or self-management dimensions are more or less to the fore in a given situation.

Linked to the issue of empowerment are patterns of participation and equality/inequality across socio-economic groups as regards access to health services and in terms of differentials in health-related behaviours and in ultimate health outcomes for individuals. For our purposes, the key issue concerns the impact of ICTs on health equality/inequality - do they widen or reduce existing disparities and divides? As mentioned already in Section 2, the concept of 'health literacy' is closely linked to the empowerment theme, and eHealth literacy is a key prerequisite for equality of opportunity to participate in the new developments and for consumers/patients to be truly empowered through ICT applications.

The remainder of this section examines the available evidence for empowering impacts of ICTs, with a particular focus on issues of consumer/patient choice, influence and capacity for self-management, as well as the implications for health equality/inequality. For both empowerment and participation, health-on-the-web applications have perhaps the greatest potential impact and this is the main focus of attention in the analysis below. However, as noted by Montegudo and Gil (2007), a wide range of other applications also have at least some degree of consumer/patient empowering potential and these are also given some attention.

4.3.1 Health-on-the-web

This section looks first at the evidence in relation to the empowering impacts of 'health-on-the web' and then examines the issue of 'eHealth' inequalities.

Empowerment through 'health-on-the-web'

There is some evidence that consumers/patients may feel more empowered as a result of usage of health-on-the-web. For example, in studies of users of online support groups Uden-Kraan et al., 2008a) the empowering outcomes mentioned by participants included being better informed; feeling confident with their physician, their treatment, and their social environment; improved acceptance of the disease; increased optimism and control; and

enhanced self esteem and social well-being. Results of another study found that similarly empowering feelings were reported both by 'lurkers' (passive, 'read only' participants) and by 'posters' (active contributors) (van Uden-Kraan et al., 2008b).

Apart from these more subjective experiences, there is also some evidence that relates to more concrete manifestations of empowerment. This is discussed in the following.

Choice of provider

The extent of choice of service providers that is available to consumers/patients varies considerably across healthcare systems. This is something that is largely built into the mainstream healthcare system so that even if ICTs may be able to support the exercise of choices that are in principle already available they may not necessarily be able to radically affect the degrees of freedom available to consumers/patients within any given healthcare system.

Finding options

One very basic way that the web can support choice is by making it easy to search for and find particular types of services – GPs, clinics, specialists, hospitals and so on. Although there appears to have been little direct research to assess the impacts of the web in this regard, it seems likely that the convenient 'look-up' and search features offered by the web have made this aspect of healthcare easier for those who have Internet access. Available data suggests that quite large numbers are actually using the web in this way in Europe (eUSER, 2005) and in the US (Fox, 2006).

Informed choice

Of more interest from an empowerment perspective is support for making *informed* choice. Relevant to this has been the emergence of provider rating systems, both official and unofficial, commercial and non-commercial. Some deal with more practical / logistical aspects, such as waiting times; some provide objective measures of quality/performance outcomes; and some provide ratings based on user reviews.

In the UK, the 'Choose and Book' system has been implemented as a national electronic referral service which gives patients a choice of place, date and time for their first outpatient appointment in a hospital or clinic. Officially compiled information is provided to support patient choice, including local transport details, MRSA rates, waiting times and whether or not the hospital provides services such as car parking, disabled access, a visitor canteen and shops. There are also ratings on various performance criteria, including results of patient surveys. The information, as well as the booking service, can be accessed in various ways, including paper, phone and the Internet. The service is extensively used and provides clear efficiency benefits in terms of reducing time lag and greater convenience compare with the traditional referral process. However, results of a relatively small-scale patient survey suggest that the planned levels of patient choice may not always be being realised in practice (Green et al., 2008).

More generally, there seems to be little evidence to suggest that such rating systems are having a widespread influence in terms of patients exercising more (or different) choice in regard to what hospitals or other healthcare providers to use. For example, a Californian study in 2007 found that whilst almost one-quarter of state residents said they knew about quality ratings web sites, very few said that they had changed provider on the basis of the data they found on the sites (California Healthcare Foundation, 2008). In Europe there is little in the way of direct evidence, although available data on patient choice more generally suggests that impacts overall may not have been very strong to date. Results from a Dutch survey of patients, for example, indicated that most did not choose a hospital by actively employing available quality and outcome information but were mainly referred by their

general practitioner (Lako and Rosenau, 2008). In a study of the situation in Norway, Sweden and Denmark, where choice of hospital has been established as a right, Vrangbaek et al (2007) found that few patients had actually chosen their hospital, although a gradual increase could be observed over the years. Lack of knowledge about rights, as well as insufficient support from GPs and limited information seemed to be the main factors restricting the exercise of choice.

Access to alternatives to the mainstream - second opinions, purchase of medications

One potentially empowering impact of health-on-the-web arises from the possibilities to (anonymously) by-pass one's own doctor to get advice or even have a consultation online, which could be important for people with stigmatising conditions, for example. There is in fact some evidence that people with such conditions (e.g. anxiety, depression, herpes, urinary incontinence) are more likely to have communicated with physicians about the condition online (Berger et al., 2005).

Another possibility for empowerment arises in terms of getting a second opinion online. In the US, in particular, quite a number of specialist 'second opinion' online services have already been established. Usage is often expensive, however, and still must largely be paid for out-of-pocket and is not typically covered by health insurance. Because of varying state regulatory issues in regard to referral and treatment, some services are not available to people residing in certain states and some require referral by their own doctor.

In many European healthcare systems access to a second opinion is managed through 'gate-keeping' processes and so is dependent on agreement and referral by ones' doctor. In practice, access to second opinions appears to vary widely across Europe (Beishon, 2007). The Euro Health Consumer Index, produced by Health Consumer Powerhouse, includes 'right to second opinion for non-trivial conditions' as one of the grading criteria. Some countries are classified as offering no right; others as offering some form of right but 'difficult to access due to bad information, bureaucracy or doctor negativism'; and some as more or less freely providing access to second opinions, with some (France, Germany) allowing direct patient access to specialists (www.healthpowerhouse.com). Against this background, online consultation services could provide an empowering mechanisms whereby patients could access second opinions conveniently and even, if necessary, bypassing existing 'gate keeping' or other barriers that may currently be preventing them.

There is no direct data on the extent of usage of online services specifically for second opinion purposes, although quite a sizeable minority of Internet users in Europe report having had an online interaction of some form with a doctor/health professional that they have not met (Kummervold et al., 2008) and considerably more report looking online for health information after having consulted their doctor (eUSER, 2005).

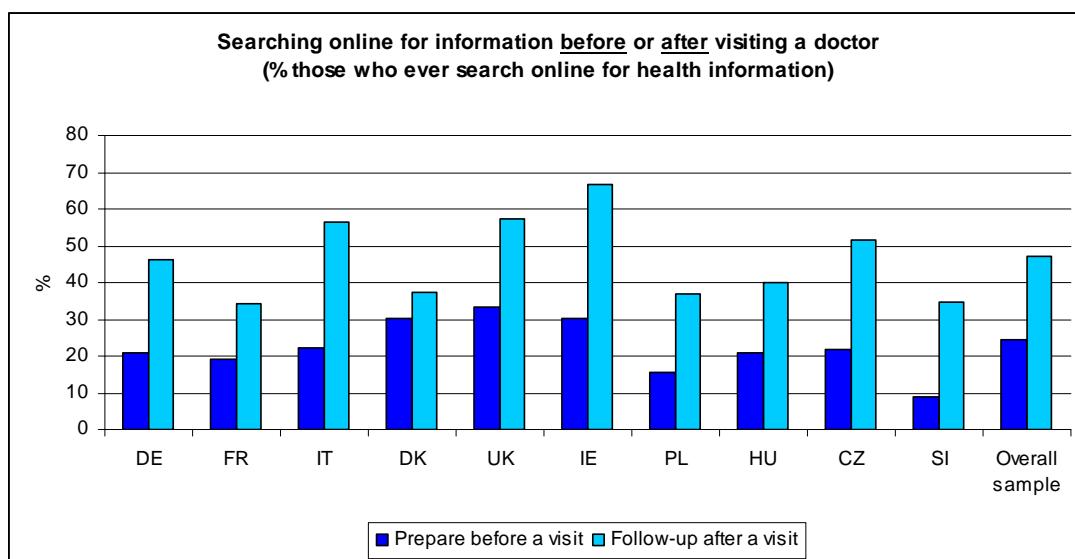
Online sale of medications, legal or illegal, is now a very visible feature of the Internet. For obvious reasons, it is difficult to find reliable data on online purchase of prescription medications in ways that circumvent the healthcare system and/or may be illegal depending on the jurisdiction(s) in question. However, available evidence suggests that the Internet may often not be the most important source for irregular or illegal acquisition of prescription medications such as painkillers (Substance Abuse and Mental Health Services Administration, 2007).

Overall, the available evidence suggests that, at least to date, consumers/patients in the main continue to rely on the conventional, mainstream healthcare system for purposes of consultation/treatment and for purchase of prescription medications. Nevertheless, a certain potential for online bypassing of the mainstream system is there and this may be being used by a growing and perhaps sizeable minority.

Influence on treatment decisions

There is clear evidence that people are using the web to look for health information that they can bring to bear in the process of reaching treatment decisions with their doctors or, sometimes, in spite of their doctors. The eUSER survey in 10 European countries in 2005 (eUSER, 2005), for example, found that almost one-half (47.1%) of those who had searched online for health information said that they had done so at least once to follow-up after having a face-to-face consultation with a doctor, whilst one-quarter (24.3%) reported having done this as part of preparation for a visit to a doctor (Figure 4.1).

It is interesting that people seem more likely to look for information *after* rather than *before* visiting their doctor, even if a substantial minority do the latter. Overall, although robust evidence is lacking, it seems that the once anticipated (or feared!) impacts of the web in terms of revolutionising the doctor-patient relationship and shifting power to the patient have not really transpired.

Figure 4.1: Searching for information before or after visiting a doctor

Data source: eUSER (2005)

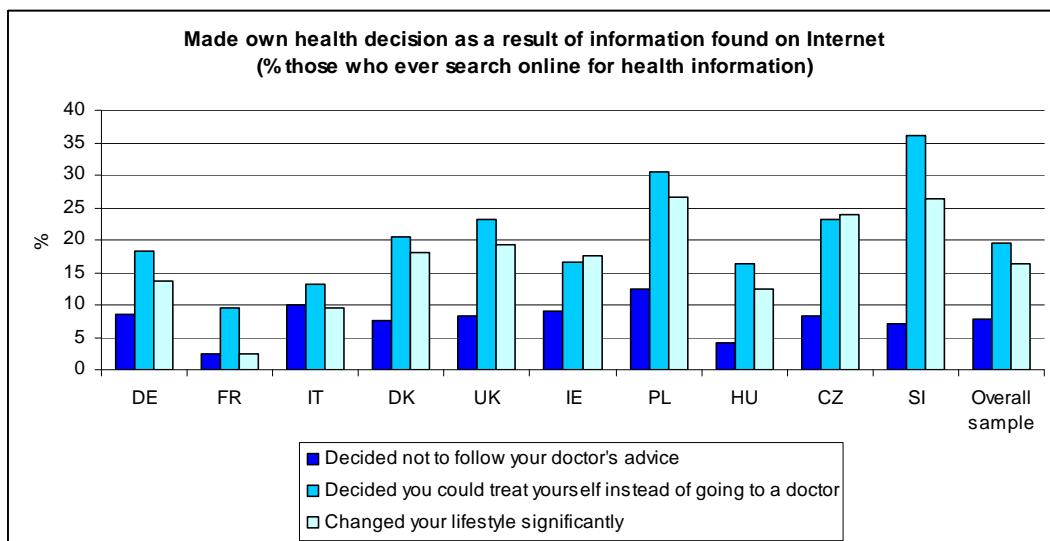
Surveys show that even in the US, where the impact of the web in the health arena and 'patient power' seem most advanced, one's own doctor remains by far the most trusted source of information and advice about health matters even if patients are also complementing this with information drawn from other sources (e.g. iCrossing, 2008).

Questions remain, however, about the extent to which doctor's are receptive to the complementary information that an increasing number of patients may bring to the consultation from their searches on the web. A US survey (Potts and Wyatt, 2002), for example, found that whilst most doctors reported that impacts (of 'web-informed' patients) on the doctor-patient relationship were either neutral or beneficial, many felt that time efficiency was reduced and most felt that there was no impact on quality of care or on patient health outcome. The suggestion then was that 'doctor knows best' remained the norm and that the potential for a widespread emergence of newly collaborative relationships had not yet become a reality. There seems to have been relatively little direct research on this topic in more recent years, although such evidence as is available does not suggest that the situation has changed to any radical degree (Mira Solves et al, 2009). Some doctors are apparently positive towards web-informed patients and some help guide their patients towards good quality websites; others are more negative and some apparently find their web-informed patients to be a threat to their own status and credibility. This is an area that needs increased research attention in order to establish a more robust evidence-base to underpin policy efforts that may be needed to encourage greater possibilities for involvement of patients in the decision-making processes.

Self-management capacity

Finally, the eUSER survey also found that about one-in-five (19.5%) who have searched online for health information said that they had ever, as a result of information found online, decided they could treat themselves instead of going to a doctor; about one-in-six (16.4%) said that they had changed their lifestyle significantly; and about one-in-twelve (7.9%) said that they had at least once decided not to follow a doctor's advice (Figure 4.2).

Figure 4.2: Making own decision based on information found on Internet



Data source: eUSER (2005)

US research also points to the impact of health-on-the-web on how people care for themselves. A survey in 2006 found that more than one-half of US health seekers reported that their most recent health information session had some kind of impact on how they take care of themselves or care for someone else (e.g. affected a decision about how to treat an illness or condition; led them to ask a doctor new questions or to get a second opinion from another doctor; or affected a decision about whether to see a doctor), although more often with a minor than a major impact (<http://www.pewinternet.org/Reports/2009/8-The-Social-Life-of-Health-Information.aspx?r=1>).

In terms of actual outcomes, there appears to be the beginnings of an evidence base that self-management interventions delivered via the internet can be effective in specific situations, for example, in terms of improving selected outcomes in certain childhood illnesses (Stinson et al., 2009).

Dis-empowerment through information/choice overload

Finally, the possible downsides of increased information and choice need to be considered, for example, the concerns that have sometimes been expressed that 'choice overload' might lead to bewilderment and anxiety, particularly for patients without access to knowledge and/or skills to understand the information and make decisions about choices on offer (e.g. Bate and Robert, 2005). More generally, the available evidence suggests that not everyone necessarily wants the same degree or type of choice in relation to healthcare matters (Green et al., 2008).

There is little direct evidence on whether any extension of choice offered by the web is in fact having negative impacts of this nature. The limited evidence that is available suggests that although the majority of online information seekers report positive experiences, a sizeable minority report negative experiences also. In a US survey (Fox, 2006), for example, 74% of health seekers said they felt *reassured* that they could make appropriate health care decisions; 56% said they felt *confident to raise new questions* or concerns about a health issue with their doctor; 56% said they felt relieved or comforted by the information they found online; and 51% said they felt eager to share their new health or medical knowledge with others. On the other hand, 25% said they felt *overwhelmed* by the amount of information they found online; 22% said they felt frustrated by a lack of information or an inability to find what they were looking for online; 18% said they felt *confused* by the information they found

online; and 10% said they felt *frightened* by the serious or graphic nature of the information they found online.

In a similar vein, a survey in seven European countries in 2005 found that twice as many respondents (19%) reported feeling relieved as reported feelings of anxiety (10%) as a result of health information they found on the Internet (Andreassen et al., 2007).

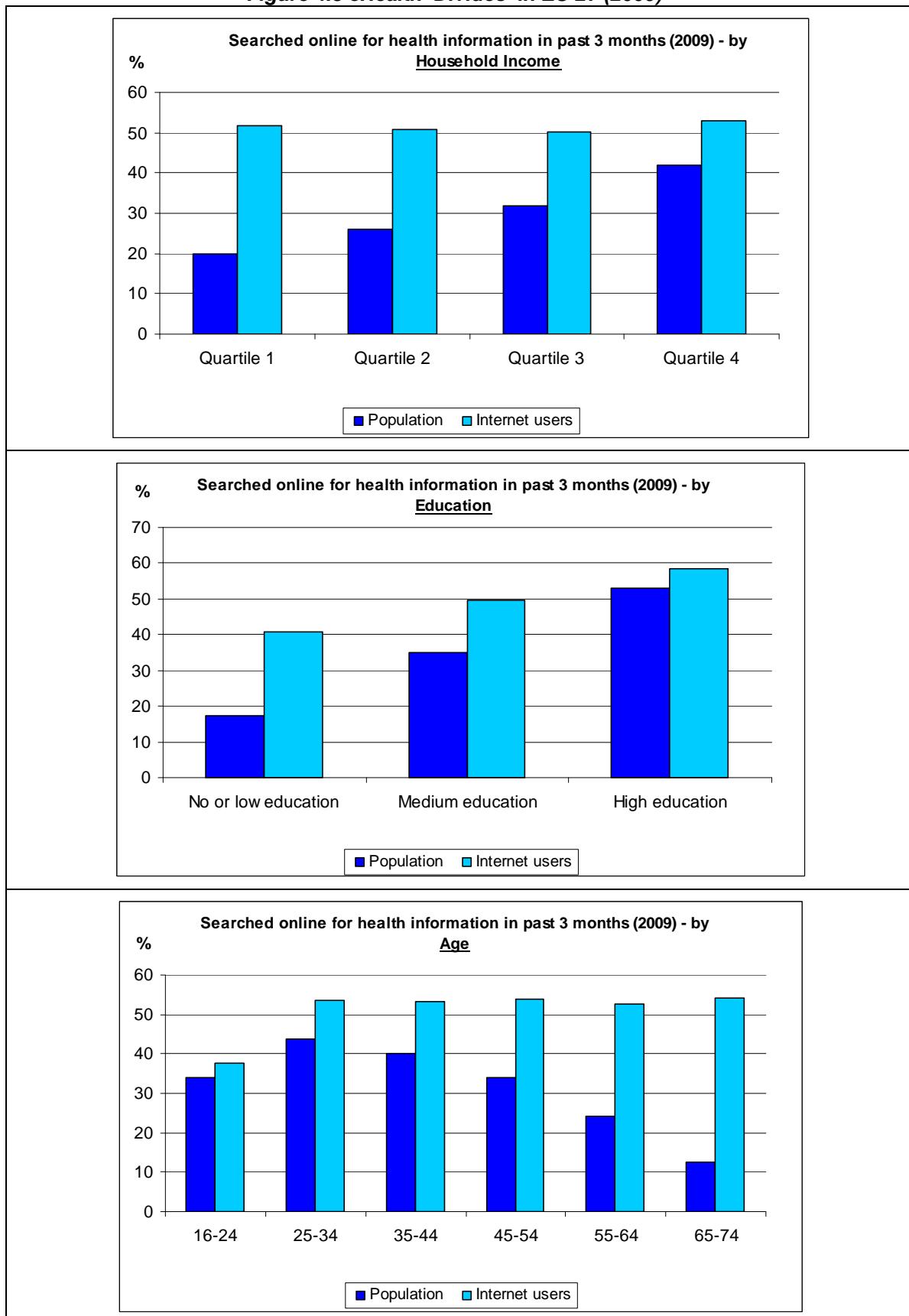
Health (in)equalities

The issue of health (in)equalities is another important aspect of the empowerment / participation dimension. Two possibilities can be considered here – that health-on-the-web might be an equaliser, helping to reduce existing health divides, or that it may exacerbate existing divides or even lead to new ones. This needs to be considered against the backdrop of the well-documented existence of both health divides *and* digital divides across socio-economic groups in the population or, as commentators have suggested, the 'inverse' laws that tend to apply in relation to care and to information – access tends to be most difficult for those who need it most (Eysenbach, 2007).

To begin to examine this it is first useful to look at patterns across socio-demographic groups as regards usage of the Internet to seek for health information. Figure 4.3 presents data on this for 2009 from Eurostat. Two types of 'divide' are apparent from this. First, there is a substantial age divide, such that those in the highest and lowest age groups are least likely to have used the Internet to look for health information in the past three months. In the case of the younger age group, lack of relevance of health issues is likely to largely explain this. For the older age group there is apparently a major underutilisation of this resource relative to need, with this linked almost entirely to low levels of Internet usage amongst this age group rather than to lack of usage of this resource by older people who are Internet users. Second, there are clear divides linked to disadvantage, with strong inverse gradients by income and education in usage of the Internet to look for health information. The data suggests that first-order divides (i.e. lower levels of usage of the Internet amongst older and disadvantaged groups) are a key factor underlying these patterns. However, there is also some suggestion of a (smaller) second-order divide (i.e. lower levels of online health seeking amongst particular groups in the Internet user population), especially as regards educational level.

Other surveys in Europe (e.g. eUSER, 2005) have found similar results to those presented above for Eurostat data. The eUSER survey also found socio-economic divides in likelihood of ever searching for health information from any source, and that there was a strong overlap between the groups who do not use the Internet and those who do not search for health information at all. Thus, whilst initiatives to reduce the first-order digital divide (through increased access to the Internet and/or to information offered via more ubiquitous media such as mobile phones) may have some impacts, more general motivational and other interventions may also be required.

In addition, whilst the basic data discussed above suggests that second-order divides in health information seeking may be relatively small, at least at the moment, there are two notes of caution that need to be considered. First, amongst current Internet users, there is little data available on how the effectiveness of people's usage of online health information resources may vary across socio-demographic groups and on the role that differentials in 'eHealth literacy' may play in this. Second, it is not at all clear that if and when the current barriers to Internet usage for more disadvantaged groups are overcome they will have the health and eHealth literacy skills, or the necessary health orientations, to make effective use of the resources on the Internet that will become available to them. In this regard, research in the US suggests that systematic motivational differences in health orientations are linked to likelihood to seek online health information (Dutta-Bergman, 2004).

Figure 4.3 eHealth 'Divides' in EU 27 (2009)

Data source: Eurostat Community survey on ICT usage in households and by individuals 2009

4.3.2 Other applications

As noted by other commentators (e.g. Monteagudo and Gil, 2007), most if not all of the other health-related ICT applications can have some degree of empowerment potential, although this is not typically considered to be their main rationale or effect. In particular, issues of equal opportunity to participate are to a large extent similarly relevant for these other applications as they are for health-on-the-web, although this does not appear to have received much research attention to date. Multi-channel access is one important mechanism for increasing equality of access, as media other than the Internet (such as mobile phones and digital TV) may have wider reach across the population. Some examples of the evidence supporting the effectiveness of mobile phones have already been presented earlier. Digital TV offers another relevant platform and is already being exploited in many health promotion programmes.

4.3.3 Synthesis and conclusions

Although consumers/patients vary in their desire for choice and influence in relation to health matters, the evidence suggests that many feel more empowered as a result of being able to find health-related information and support on the web. Most consumers/patients who look for health information online report being better informed, and this can be brought to bear when making healthcare decisions and in interacting with doctors. Consumers/patients also have the possibility to use online rating sites to record and voice their experiences of health providers they have used. On the other hand, the Internet has extended the reach of various vested interests and their potential to influence consumers/patients, for example, in the advertising and marketing of medications. Some web-based and other eHealth applications also raise the possibility of increased transparency of customers to insurers.

Many people are now researching health information before and after consulting their doctor, and a minority report having made their own health decisions (including sometimes not following their doctor's advice) as a result of information found on the web. A sizeable minority of Internet users in Europe also report having had an online interaction of some form with a doctor or health professional that they have not met. Although there is currently a lack of robust evidence on the impacts of these developments on the traditional doctor-patient relationship or on 'gate-keeping' mechanisms in healthcare, overall it seems that health-on-the-web has not yet led to a substantial bypassing of the existing 'bricks-and-mortar' health system. The 'grey' area of online marketing and purchasing of medications remains an issue, however.

Finally, there are various health-on-the-web developments (such as provider rating sites and 'choose and book' services) that, at least in principle, can give consumers/patients more choice and/or more information to support choice in what hospitals, specialists or other healthcare facilities to select when such services are needed. Although this can increase the possibilities for informed choice, available evidence suggests that consumers/patients still give most regard to the recommendations made by their own doctor. In addition, it seems that constraints within the 'bricks and mortar' health system can often limit the possibilities for real choices to be exercised in practice.

Overall, the Internet has made a lot more health information available, and more easily available, for consumers/patients. However, the quality may be variable and there can be risks of overload so users need good 'eHealth literacy' skills in order to get the most of this. In addition, whilst health-on-the-web may empower in various ways those who have access to the Internet, the flip side of this is that those who are not online may become relatively more disadvantaged in relation to health matters. For them, the experience may be more one of dis-empowerment through inability to participate in new opportunities. Factors linked to existing health divides, including lower health literacy and less proactive health orientations continue to contribute significantly to unequal health experiences and outcomes of less advantaged socio-economic groups. There is already some evidence that these

groups may be experiencing a 'double jeopardy' as a result of an intertwining of these traditional health divides with the new digital divides.

Finally, 'health 2.0' applications provide potential for collective empowerment through mobilising interest groups and facilitating collective action. One relevant development is the growth in websites providing user ratings of experiences with healthcare providers. This may potentially encourage increased quality standards, although there seems not to be strong evidence for this as of yet. Other emerging developments include the possibilities for new collaborative relationships between consumers/patients and professionals, such as collective pooling of experiences of side effects of medication or other health experiences, and some examples of this can already be found.

4.4 Information and lifelong learning

For the consumer/patient, the unprecedented access to information about health matters that the web provides and the possibilities for people to draw upon the Internet's resources to develop their knowledge on a continuous, ongoing basis is perhaps the single most significant change heralded by ICTs in the health domain. This informational aspect underpins many of the themes discussed in the empowerment and networking & social capital sections, as well as many of the applications discussed in the rationalisation section. In this section the information/lifelong dimension is examined in its own right.

Health-on-the-web is the most significant application area in this regard and will be the main focus of the analysis in this section. Other modes of delivery of information (e.g. mobile and digital TV) as well as other applications in the home/self-care and educational 'push' fields also have some relevance and are also addressed, but more briefly.

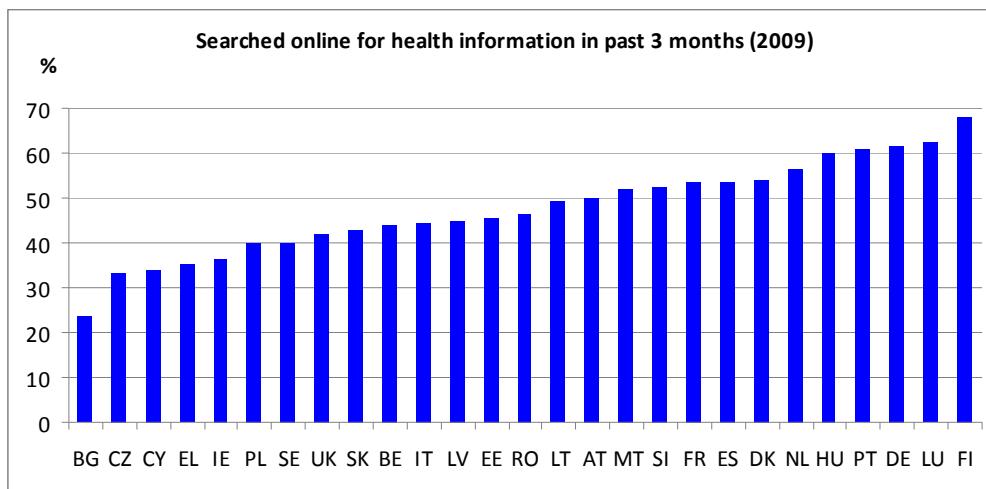
4.4.1 Health-on-the-web

Section 3.1 already presented some basic data on the extent of online health information seeking in Europe and the US. This section first looks at some of the patterns that can be observed across European countries and socio-demographic groups. The analysis then examines the types of information people are looking for and the impacts that health information on the web is having for patients/consumers.

Patterns across countries

One aspect of interest is the considerable variation across countries in the percentage of the population that searches online for health information. In part, of course, this is linked directly to levels of Internet penetration (only those who have an Internet connection can do this), but there is also considerable variation across countries in levels of usage amongst those who are Internet users. Based on the Eurostat indicator and data, levels of usage amongst Internet users in 2009 ranged from a low of just under one-in-four (23.5%) in Bulgaria to a high of more than two-thirds (68.1%) in Finland, as shown in Figure 4.4.

These differences could be linked to a variety of factors at the country level, including factors related to Internet diffusion processes (e.g. proportion of users who have been users for a longer time), to supply side factors (such as the availability and attractiveness of suitable online services/content in the health field), to cultural or contextual factors concerning the health domain in the country (e.g. extent to which patient/consumer choice, 'shopping around', seeking second opinions and so on are to the fore), or to a combination of some or all of these. There is currently only limited data available to help throw light on these aspects and, even then, it is not possible in this report to exhaustively examine such data as is available. However, the basic data from Eurostat does show the influence of Internet-related factors, even if they do not explain all of the variations across countries.

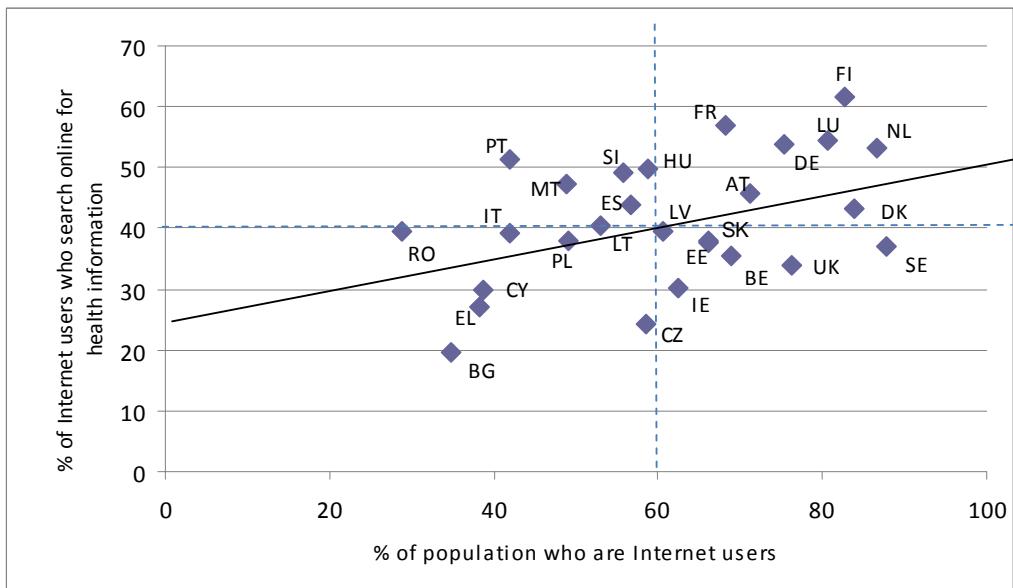
Figure 4.4: Online searching for health information - Internet users (2009)

Data source: Eurostat Community survey on ICT usage in households and by individuals 2009

Figure 4.5 presents a plot of prevalence of online health seeking (amongst Internet users) against the level of Internet penetration in the respective Member States. Overall, the correlation is quite strong ($r=0.45$) and levels of Internet usage, alone, can explain about 20% of the variance in online health seeking amongst those who are Internet users. This effect replicates that found in previous research (SIBIS, 2002), where the effect was found even when the proportion of Internet users who were experienced users was controlled for. One possible explanation might be the operation of some sort of ‘network effect’ whereby the more people that are online the more a given individual is likely to do a particular thing (in this case search for health information) online. Part of the reason for this may be due to a greater likelihood of becoming aware of and/or interested in the possibilities (because of a greater likelihood to come across it amongst one’s social networks) but other factors may also be at play, such as more offering of useful online services in countries with higher Internet usage rates.

To investigate these factors, the eUSER survey examined a variety of Internet-related and health-related (user side and supply side) factors in a multivariate analysis of online health seeking amongst Internet users in ten EU countries (eUSER, 2005). Results showed that both user-side (intensity of usage, skills and style of usage) and supply-side (level of development of online health services available in the country) factors were strong predictors. Overall, however, the important issue of how online health activities relate to the wider health care systems (online and offline) in the different countries has received relatively little research attention and this is an important topic for research and policy attention in this field. For example, as mentioned already in section 4.3, we know very little about whether and in what ways particular forms of usage can be linked to particular issues faced by consumers/patients under particular healthcare systems, such as the degrees of freedom they have to shop around for providers and second opinions.

Figure 4.5: Plot of Internet usage rates against percentages of Internet users searching online for health information (2008)

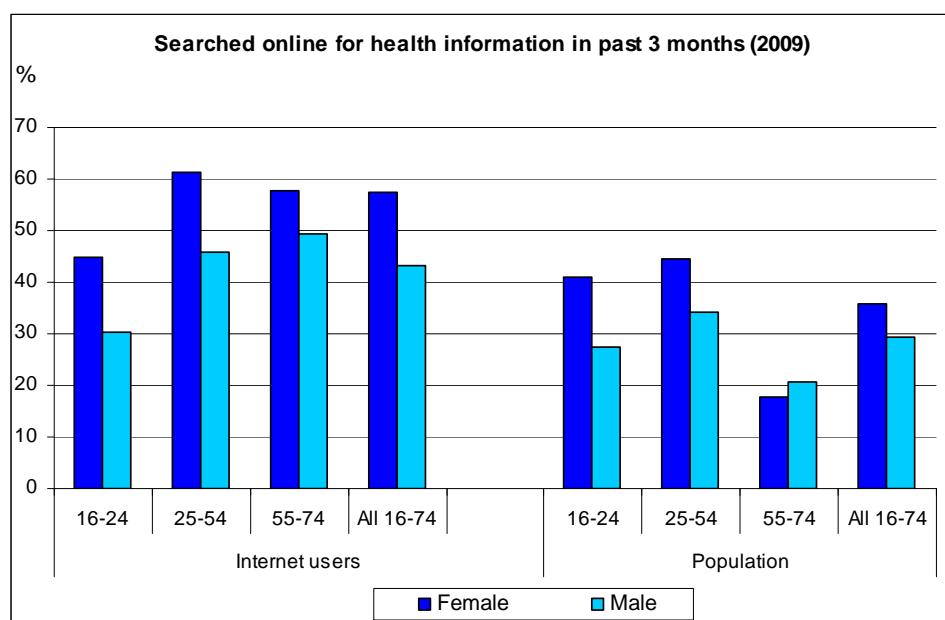


Data source: Eurostat Community survey on ICT usage in households and by individuals 2008

Socio-demographic patterns

The impacts of digital and health divides in terms of gradients across socio-economic and age groups in online searching for health information have already been presented and discussed in Section 4.3 in relation to the empowerment/participation dimension. Another significant pattern relates to gender, where the Eurostat data from 2009 shows that, amongst Internet users, women in all age bands are a lot more likely than men to have searched online for health information (Figure 4.6).

Figure 4.6: Gender patterns in usage of the Internet to search for health information in last 3 months (2009)



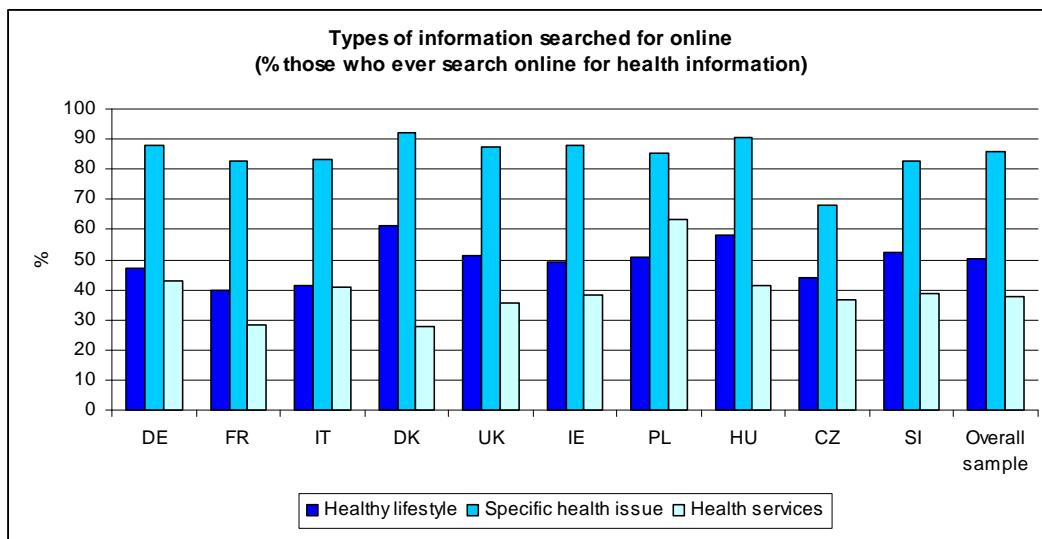
Data source: Eurostat Community survey on ICT usage in households and by individuals 2009

These patterns generally translate to the population level, although the gender differences reduce to a certain extent, and even reverse slightly in the 55-74 years age group, mainly because of higher levels of Internet usage amongst men in this age group. The gender pattern in online health information seeking is also found in health information seeking from any source, with consistent findings that women are more likely to do this than men (e.g. eUSER, 2005).

Types of information sought

Whilst the Eurostat data does not provide information on the types of health information that is being sought online by health information seekers in Europe, this aspect was addressed by the eUSER survey in 2005. As shown in Figure 4.7, amongst those who ever searched for health information, seeking information about specific conditions or treatments was most common (85.8%), followed by information about healthy lifestyles (50.2%) and then by practical information about health services that are available (37.6%).

Figure 4.7: Types of health information sought online



Data source: eUSER (2005)

The PEW surveys from the US provide a more differentiated picture for that country in terms of the particular topics that were searched online (Fox, 2006), as the data for 2006 in Table 4.2 shows. Again, it can be seen that looking for information in relation to illness/treatment is most commonly reported, although wellness- or lifestyle-oriented information seeking is also very common.

Types of site/service used

Available evidence from both Europe and the US suggests that the most common ways of searching for health information is to use a general search engine (eUSER, 2005; Fox, 2006), although use of dedicated health portals appears to be growing. Recent research in the US provides some quantitative evidence for the growing importance of Health 2.0 sites, with one-third of those who looked for health information online reporting use of some form of social media / web 2.0 site such as discussion forums, wikis etc.(iCrossing, 2008).

Table 4.2: Health topics addressed by online searchers (US, 2006)

Health Topic	%
Specific disease or medical problem	64
Certain medical treatment or procedure	51
Diet, nutrition, vitamins or nutritional supplements	49
Exercise or fitness	44
Prescription or over-the-counter drugs	37
A particular doctor or hospital	29
Health insurance	28
Alternative treatments or medicines	27
Depression, anxiety, stress or mental health issues	22
Environmental health hazards	22
Experimental treatments or medicines	18
Immunizations or vaccinations	16
Dental health information	15
Medicare or Medicaid	13
Sexual health information	11
How to quit smoking	9
Problems with drugs or alcohol	8

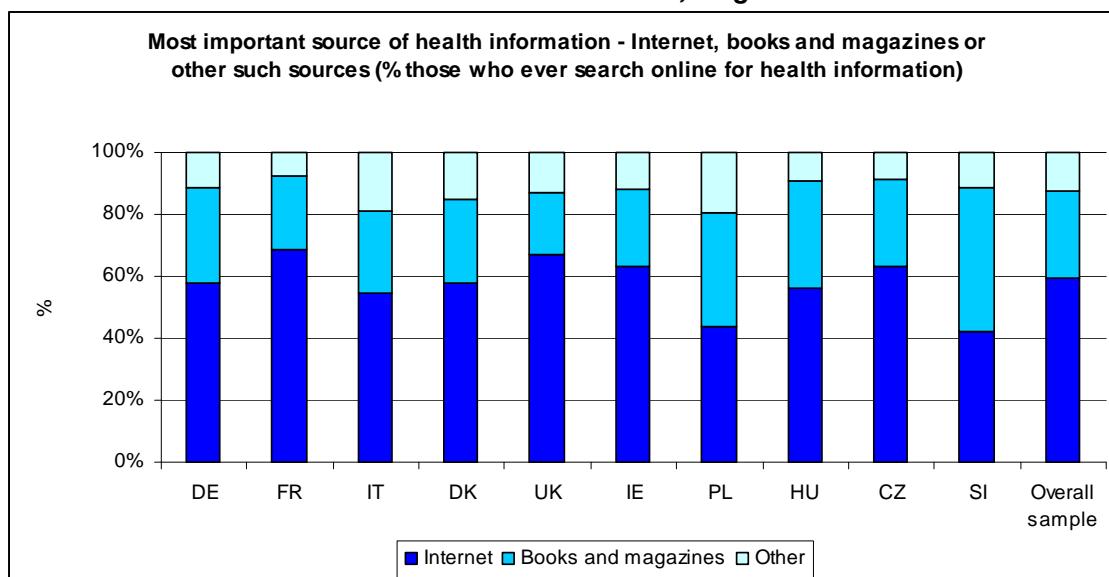
Data source: Fox (2006)

Relative importance of the Internet

The available information indicates that the Internet has become a key source of health information for many people. The eUSER survey in Europe, for example, found that almost sixty per cent of those who ever used the Internet to look for health information rated this as more important than books, magazines or other such traditional sources of information (Figure 4.8). Data from a US survey also includes comparison of the Internet with sources such as doctors and other medical professionals, as well as relatives/friends/co-workers (iCrossing, 2008). The top three sources reported to have been used to find or access health and wellness information in the past year were the Internet (59%), a doctor - primary care or specialist (55%) and relatives/friends/co-workers (29%). The US data also showed various socio-demographic patterns in usage of the different sources. For example, those aged 55 and over were considerably more likely than other age groups to consult their doctors for health and wellness information, as were women (although they were also more likely to have used the Internet for this).

More generally, the continued and central importance of doctors is reflected in the US data on trust in different information sources that has already been discussed in Section 4.2. Primary care physicians are by far the most trusted source of information about health and wellness issues, followed by other professionals such as specialists, nurses and pharmacists.

Figure 4.8 Internet as the most important source of health information compared to more traditional sources such as books, magazines etc.



Data source: eUSER (2005)

Impacts on knowledge

The eUSER survey also provides data on how users perceive the Internet to have impacted on their health-related knowledge. As shown in Figure 4.9, a very large majority (more than ninety percent) of those who have searched online for health information said that the Internet had made them more informed about health matters. About one-in-three said that it had made them a lot more informed and three-in-five said that it had made them somewhat more informed.

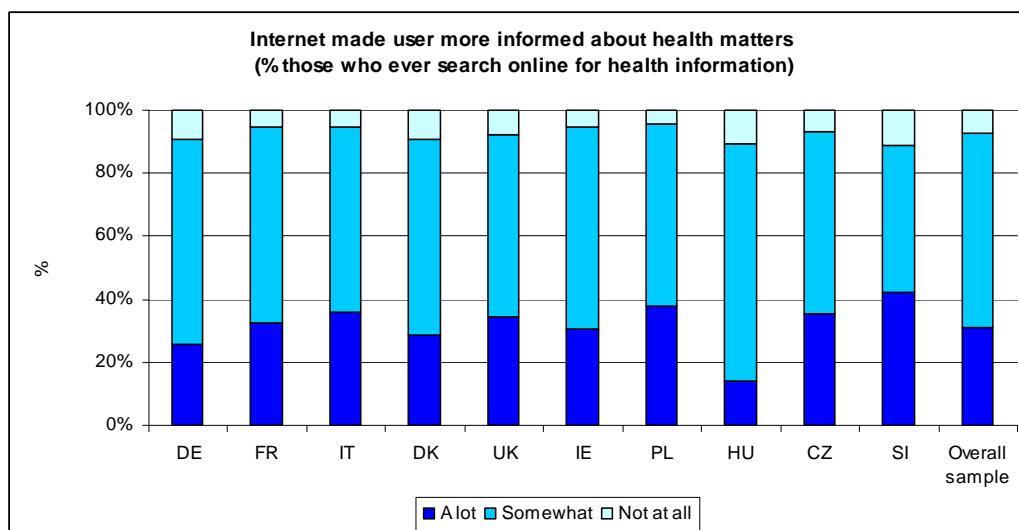
Information overload and ‘cyberchondriacs’?

Although concerns have been expressed that access to the large amounts of information available on the Internet might lead to information overload and consumers/patients being overwhelmed or otherwise distressed, the evidence suggests that the overall tendency seems to be a lot more towards positive than negative experiences. As discussed in Section 4.3, this has been the finding in surveys in both Europe (Andreassen et al., 2007) and the US (Fox, 2006). Overall, the information/knowledge gained on the Internet seems to be empowering in various ways for many people.

Quality of information online

Finally, many concerns have been expressed about the quality of the health information found on the Internet and the harm that poor quality or even wrong information might cause. A systematic review in 2002 (Eysenbach et al., 2002) found that the majority (70%) of reviewed studies concluded that online health information quality is a problem, although the reliability and robustness of the evidence varied considerably. A number of studies have also found that users may not use rigorous criteria to assess a site's credibility and may tend to pay more attention to superficial aspects of a site, such as visual design and a professional look, than to its content (Eysenbach and Kohler, 2002; Fogg et al., 2002). In response, various user supports have been developed in order to help ensure that good quality information is found and acted upon, such as codes of practice, labels, ratings, guided search, filters and user education (Greenberg et al., 2004).

Figure 4.9: Extent to which Internet makes users more informed about health matters



Data source: eUSER (2005)

More generally, other studies have found little evidence of poor quality information on the Internet actually causing harm to people's health (Crocco et al., 2002). It has also been suggested that concerns about quality that have been voiced up to now may have become superseded to a substantial degree by the emergence of Health 2.0 (Deshpande and Jadad, 2009), with the emphasis on sharing of information and experiences amongst large numbers of peers. In addition, US research has suggested that many users tend to be healthily sceptical as regards information that they find on the internet (Fox, 2008) and, typically, doctors remain the most trusted source of information when people have a health problem (Fox, 2008; iCrossing, 2008).

4.4.2 Other applications

Most of the other applications offer some potential to support the information & lifelong learning dimension to a greater or lesser extent. As discussed in relation to equality in section 4.3, for example, platforms other than the Internet, such as digital TV and mobile phones or other handheld devices offer considerable potential to extend the reach of services beyond those who have access to the Internet. This is already being extensively exploited in some countries, for example, NHS Direct digital TV in the UK. Home telehealth and self-care systems/devices also offer considerable potential, especially for continuous learning and development of capacity to self-manage for people coping with chronic diseases. More generally, 'push' technologies such as mobile texting offer significant potential for delivery of information and increasing capacities of hard-to-reach groups, and some of the evidence for this has already been reviewed in section 4.1 under the 'rationalisation' dimension.

Finally, although not the main focus in the current analysis, health-on-the-web for doctors also has a major relevance, to the extent that it helps them find information to support treatment decisions and more generally to keep up to date on evidence-based medical knowledge and other health matters.

4.4.3 Synthesis and conclusions

Health-on-the-web, in particular, heralds a major transformation in the possibilities for access to information and lifelong learning on health matters for consumers/patients. The evidence shows that this resource is being extensively used and has become a central component of the health information resources used by many people. This informational dimension

underpins much of the impacts that have been identified and discussed along the other social impact dimensions – rationalisation, networking & social capital, and empowerment & participation. Quality of health information online and the 'eHealth literacy' skills that are needed to find and appropriately use relevant information are thus of central importance.

4.5 Conclusions

The three application groupings addressed in the social impact analysis differ considerably in their nature and (social) logic. When the four social impact dimensions (rationalisation, networking & social capital, empowerment & participation, and information & lifelong learning) are applied to these, they help uncover a very broad mix of 'social', 'socioeconomic' and 'health' phenomena. Although all of these phenomena are of relevance and interest, two particularly interesting themes can be identified. One theme concerns the possibilities for consumer/patient empowerment and enhanced health-related social capital through health-on-the-web and the other concerns the possibilities for 'win-win-win' outcomes from telecare and home telehealth.

Large numbers of consumers/patients are now using a wide variety of health-on-the-web services/applications and this is an important social phenomenon in its own right. Although truly revolutionary impacts on doctor-patient relationships and usage of healthcare systems seem not yet to have resulted, there is some evidence that health-on-the-web can be empowering for users in various ways. As regards social capital, online support groups may well be providing some of the types of social support that socio-medical research has found to play a major role in positive health experiences and outcomes more generally, but further research would be useful in order to assess the extent to which virtual support can also deliver the positive health impacts that have been found for more traditional forms of social support. The flip side of all of this, of course, is that those who are not online may become relatively more disadvantaged in relation to health matters, and there is some evidence that this may be occurring.

As regards telecare and home telehealth, many commentators have suggested that these offer considerable potential to deliver a 'win-win-win' scenario, whereby the needs of older people are supported whilst simultaneously helping with cost containment in health and social care systems and opening up new markets for European ICT and related industries. Although many trials report quite promising results in this regard, the available evidence is still limited and there is a need for more robust assessment. In some cases, the technologies and applications are quite well proven, but the social and organizational aspects of their implementation seem to be a lot more challenging. There are also important ethical issues that arise in this area, such as maintenance of privacy and dignity when implementing applications involving surveillance of the home and / or lifestyle monitoring. Overarching issues around how much emphasis should be given to technology-supported care in the search for solutions to the challenges posed by demographic ageing and about the implications of these applications for the sharing of caring responsibilities between formal care services and the family also need to be addressed.

5 Conclusions and policy implications

The social impacts of consumer/patient-facing ICTs in the health domain cover a broad-ranging and complex field of enquiry from which clear policy recommendations do not automatically emerge. This Chapter first discusses some of the complexities that have relevance for EU policy and then briefly examines some alternative visions that could underpin policy in this field. A number of concrete suggestions for EU policy are then identified and discussed.

5.1 A complex field, spanning a range of policy domains

The evidence and analysis presented in the report covers a wide range of healthcare activities and dimensions of social impact. Given the focus of this study on *social* impacts, there is a need to address the question of what phenomena and what 'outcomes' should be given central place in deriving policy implications. Should the main emphasis be on concrete 'final' outcomes in terms of health impacts or should equal or greater attention be focused, in their own right, on the social phenomena that are emerging? The dimensions of central interest may also vary across policy areas. Social policy, for example, might emphasise issues such as equality, social cohesion and active citizenship; public health policy might emphasise the ultimate impacts on the health of individuals; consumer policy might emphasise issues of consumer choice and consumer protection in health matters; health economics might emphasise issues of cost-effectiveness and cost-containment; and industry support policies might emphasise the possibilities for growing new markets for innovative ICTs in the consumer/patient-oriented healthcare field. An issue to be considered, therefore, concerns where the main 'centre-of-gravity' of policy to address social impacts should be located and how best to develop coherence and synergies across the relevant policy domains.

The current level of maturity of the field of enquiry as regards capacity to support evidence-based policy also needs to be taken into account. There is a very wide range of existing evidence, some from research from the medical/healthcare perspective and some from sociological and other disciplines. A diversity of methodologies has been employed, with a consequent diversity in the rigorousness and robustness of the resultant evidence-base, as well as incomplete coverage of the full range of issues of policy interest. For some issues the trends are already quite clear; for others the phenomena of interest are only emerging and/or the necessary research has yet to be conducted.

As in other fields, EU policy in this domain needs to be developed in compliance with the principles of proportionality and subsidiarity. Assessing issues of proportionately will require calibration of the importance of the variety of social phenomena and impacts that can be discerned, and identifying the types of intervention that are possible and appropriate at EU level. As regards EU subsidiarity principles, the wide heterogeneity of healthcare systems across the Member States presents an important contextual backdrop that needs to be taken into account. For example, the realities of consumer/patient choice and empowerment vary widely across the Member States, even if the rhetoric is often the same. To be truly empowered, consumers/patients need not just be to be better informed (and health-on-the-web can substantially contribute to this) but also to have access to a healthcare system that is receptive to the informed consumer/patient and offers the necessary degrees of freedom to enable informed choice.

Apart from the issues outlined above, there is also the overarching question of what vision should underpin policy in this field. For purposes of this social impact analysis, three contrasting visions can be suggested – business-as-usual, economic and transformative. Although these may somewhat artificially polarise possible policy approaches, they do serve to highlight some key variants as regards where the policy 'centre-of-gravity' might be placed.

A *business-as-usual* approach would essentially adopt a conservative stance, although the policy focus could range from the defensive (discouraging ICT developments and usages that might challenge the current status quo in healthcare) to the more positive (encouraging developments where ICTs deliver efficiencies and/or effectiveness gains to existing processes in the healthcare system). Such an approach, however, might avoid challenging resistances on the part of healthcare organisations and practitioners to desirable ICT-driven changes in healthcare processes.

An *economic* focus might emphasise the rationalisation benefits that can be gained through ICTs in the healthcare field, such as cost-containment in public healthcare systems and business opportunities for profit-oriented sectors (including private healthcare providers and suppliers of relevant ICT products and services). A key policy focus in this case, for example, could be especially on the economic components of the 'win-win-win' possibilities that have been postulated for telecare and home telehealth. An uncritical focus on the economic potential alone, however, would risk losing sight of fundamental ethical issues that arise in relation to encouragement of widespread implementation of these applications.

A *transformative* approach would be a more radical one, with a policy focus on leveraging the possibilities for innovation and change in aspects of healthcare where this is judged to be warranted. A key policy emphasis here, for example, might be on the potential offered by health-on-the-web for enhanced consumer/patient empowerment.

5.2 Some concrete suggestions for policy

Although the elaboration of policy in this field requires reflection on the types of issues outlined above, it is nevertheless possible to identify some initial topics where policy actions seem warranted on the basis of the available evidence and the analysis that has been conducted. These are:

- more attention to 'health-on-the-web' within eHealth and other relevant policy fields
- support for an informed public and professional dialogue on the social and ethical aspects of telecare and home telehealth for older people
- focused efforts to address cultural, organisational and other systemic barriers to embedding consumer/patient-facing ICT-based innovation within healthcare
- support for more European-focused evidence gathering in this field, as much of the current evidence and research emanates from the US.

Greater policy attention to 'health-on-the-web'

There is a need for greater EU policy attention to health-on-the-web, given its increasingly important role in the health-related activities of consumers/patients in Europe. The main EU efforts to date have focused on quality of online health information (through a code of conduct published in 2002⁹) and on the development and operation of the EU online health portal¹⁰. Efforts to monitor the wider evolution and impacts of health-on-the-web have been limited, with just a simple item included in regular Eurostat data and a few ad hoc surveys funded under EU programmes.

⁹ Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions - eEurope 2002: Quality Criteria for Health related Websites <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52002DC0667:EN:NOT>

¹⁰ Health-EU Portal. http://ec.europa.eu/health-eu/index_en.htm

Citizen empowerment in relation to health matters has been espoused as a central theme in EU health policy¹¹. However, the available evidence suggests considerable variation across the Member States in the nature and extent of 'official' applications of health-on-the-web to support consumer/patient empowerment. Neither at EU nor Member State level has much attention yet been given to the important topic of 'eHealth literacy' for consumers/patients. Overall, the extent of policy attention given to health-on-the-web and the resources allocated to research and other activities addressing this topic have been very much lower than for other ICT developments in the healthcare field.

In particular, there could be an increased focus on this domain within eHealth policy and RTD, including more attention to the important issue of 'eHealth literacy' for consumers/patients. This could be supported by more in-depth benchmarking of developments across the EU, including surveys of users and mapping of the supply side. As health-on-the-web has a cross-cutting relevance for a number of strands of EU policy, including information society, public health, consumer and social policy, encouragement of a coordinated approach across these policy lines would also be valuable. In this context, relevant topics might include the interactions between health-on-the-web and mainstream healthcare systems, consumer/patient protection in health-on-the-web, and the potential implications of health-on-the-web for cross-border healthcare.

Social/ethical aspects of telecare and home telehealth for older people

For some observers and practitioners the case for widespread deployment of ICT-based products and services to support independent living and homecare for older people is 'self-evident' on the basis of their apparent functionality and utility value. Others take a much more circumspect and critical view on this, and raise concerns about how far technology-based solutions can really contribute to meeting the essentially human needs of older people and fitting with the types of human services that have traditionally serviced these needs. The challenge is to find a balanced path towards the type of 'win-win-win' outcomes that have been postulated in the policy context, whereby older people's needs, cost-containment in health and social care, and new market opportunities for the European ICT industry come together in a synergistic and harmonious manner.

The current evidence-base on the 'value' case is not yet very strong, either for the 'quality' case (the benefits for older people in terms of meeting their real needs) or for the 'business' case (the cost-containment and other economic returns that can be achieved). This lack of evidence has been frequently cited as a limiting factor that has slowed the wider implementation of ICTs in the care of older people. Important social and ethical issues also need a lot more attention, and the ethical perspective is central to the linking and balancing of the 'quality' and 'business' cases. There is also evidence to suggest that the relative importance given to ICT-based care as opposed to other care solutions may vary considerably across countries.

The recent Communication¹² of the Commission on telemedicine gives attention to these issues as they arise in relation to telemedicine and, in particular, to health tele-monitoring. Actions to be implemented include support for better evidence gathering and promotion of exchange and dialogue between Member States and the other relevant stakeholders. In the case of care for older people, the solutions required go beyond telemedicine to also encompass a range of ICT applications that can support social care and independent living for older people. In particular, the 'telecare' model of remote monitoring and support for older

¹¹ Together for Health: A Strategic Approach for the EU 2008-2013. White Paper. Brussels, 23.10.2007. COM(2007) 630 final

¹² Telemedicine for the benefit of patients, healthcare systems and society. COM(2008) 689 Final. November 2008

people is now beginning to diffuse quite widely. This brings to the fore additional ethical and other issues of social concern, and broadens the range of stakeholders to include social care, housing and other players in the wider long-term care domain.

The European Commission has launched an action plan on 'ageing well in the information society'¹³ that aims to support the achievement of the 'win-win-win' possibilities that been suggested for the application of ICTs in this field. In order to complement this and reinforce the social dimension, a focused, EU-driven policy initiative to examine the social and ethical aspects of telecare and home telehealth in long-term care for older people would be valuable.

This could aim to initiate and sustain an informed public and professional dialogue on the role of these applications in care for older people, and on how to achieve a balanced path towards the 'win-win-win' possibilities that appear to be presented. Actions at EU, national and local/regional levels could be promoted, bringing together relevant stakeholders such as policy-makers, user groups (older people, family carers), RTD/industry, long-term care services, social scientists and applied ethicists. More extensive research on the social and ethical dimensions could also be supported in order to strengthen the evidence-base for policy in this field.

Focused effort to address cultural, organisational and other systemic barriers

It is recognised that a variety of cultural, organisational and other systemic barriers have slowed the implementation of ICTs in the health domain. Such barriers continue to be an important factor in relation to the diffusion of innovations such as telecare and home telehealth. Although the relatively unfettered environment of the Internet has enabled the rapid evolution of 'health-on-the-web' applications and their widespread usage by consumers/patients, there are substantial differences across European healthcare systems in terms of their conduciveness to the types of consumer/patient empowerment and patient-centred innovation and change that this can make possible.

A focused EU-driven effort could be initiated to address the cultural, organisational and other systemic barriers within healthcare that have tended to impede wider provision and exploitation of patient-facing eHealth services, and to limit their integration within the mainstream 'bricks-and-mortar' healthcare system and processes. This would need to involve the Member States as well as other relevant stakeholders such as professional associations, and be supported by research to provide a deeper understanding of the nature and impacts of cultural, organisational and other systemic factors affecting the diffusion of consumer/patient-facing ICT-based innovations.

Support for improvement of the existing European evidence-base in this field

Finally, support could be provided for more European-focused evidence gathering in this field, as much of the current evidence and research emanates from the US. This could include benchmarking, case studies, consolidation of available evidence, and multi-disciplinary studies, with an emphasis on cross-country research to identify European best practice and support policy coordination at EU level.

Some specific areas where the evidence-base needs to be improved have already been mentioned in the other policy recommendations above, such as benchmarking health-on-the-web developments, research on the social/ethical dimensions of telecare and home telehealth for older people, and research on the nature and impacts of cultural, organisational

¹³ Ageing well in the information society. An i2010 Initiative. Action plan on information and communication technologies and ageing. COM(2007) 332 Final

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0332:FIN:EN:PDF>

and other systemic factors affecting the diffusion of consumer/patient-facing ICT-based innovations. A first priority could be given to better benchmarking of health-on-the-web developments across the EU, including surveys of users and mapping of the supply side. Also of value would be assessment of the levels of 'eHealth literacy' amongst consumers/patients and examination of the attitudes and practices of doctors in relation to patients' usage of the web for health purposes.

More generally, there is a need for a wider programme of research on the social and health impacts in this field, including both systematic meta-analysis of existing research and new research based on multidisciplinary perspectives.

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0 Executive Summary

Introduction

The focus of the “community and family” domain is the impact of ICTs, in particular the Internet, mobile telephony and “personal communication technology”, on **sociability** and **social interaction**. This refers to the quality of individuals’ social relations within their social environment, including the family and the communities they belong to. The reason for choosing our focus lies in the interest which the question about **ICT's impact on sociability** has attracted in recent years not only among social researchers but also among policy-makers concerned with a wide range of topics including employment, social welfare and equality, economic competitiveness, education systems, and urban and regional development.

The analysis makes reference to the ongoing debate around the notion of **social capital**, which is understood as “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit”¹. Before a larger body of empirical research had become available, many scholars believed that communication through the Internet would inhibit interpersonal collaboration and trust and, as such, would be detrimental for social capital building and maintenance. A lot of empirical research carried out in the last 10 years has challenged this assumption.

Following the **overall design of the study**, our approach was to first remind ourselves of the long-term **paradigmatic societal trends** in the domain in Europe, before exploring the role which ICTs have played within the context of these trends.

The analysis is, as much as possible, based on the findings of methodologically robust **empirical research** from Europe.

Long-term trends in the domain

Sociability has been at the core of public debate for as long as human beings have discussed about what's right and wrong about society. Since the industrial revolution, at the latest, Europeans are concerned about the quality of interaction between people within families, neighbourhoods, urban settlements, and countries. This is an issue of substantial importance, since one of the most consistent findings from research into sociability, across numerous disciplines including sociology, ethnography, biology, medicine and psychology, is that people with stronger social networks tend to be healthier and happier.

Community is a form of social organisation based on a network of individuals, who maintain relationships and who share a feeling of belonging together. Social organisation is subject to a wider context of dynamics that lead to a transition in meaning of basic forms of social relationships: community and society are permanently evolving. Traditional communities are understood as having been based mainly on ties of blood and/or destiny, where co-location in physical space (i.e. in the same neighbourhood or village) plays a key role for developing a collective identity. Such ideal-type communities, as described by Tönnies und Durkheim, have become very hard to find, as European society has been engaged in “a historical process of separation between locality and sociability in the formation of communities”, as

¹ Nahapiet & Ghoshal (1998)

Manuel Castells stresses. "New, selective patterns of social relations substitute for spatially bound forms of human interaction"².

The changing understanding of community is strongly related to **individualisation** as the dominant trend in the evolution of social relationships in Europe in the 20th century. While traditionally the physical location (e.g. neighbourhood, village) to some extent determined the interpersonal ties which provided a person with sociability, support, information, a sense of belonging, and social identity, today communities tend to be actively constructed by individuals according to their interests, values and perceived needs. The notion of community has rid itself of being spatially bounded. People do not belong to one community only, but are member of different types of specialized communities.

Against this background it has been suggested to describe the evolving patterns of sociability in the network society as "**network individualisation**" or "networked individualism" with the nuclear family in the household still at its core, from where networks of selective ties are built according to the interests and values of each member of the household. Networks have become so differentiated that people are involved in sets of narrowly defined relationships with changing network members – there is no single community as the only source for identity.

Network individualisation is related in manifold ways with changes in the role and structure of the **family**. A number of major demographic changes have taken place throughout Europe, although in different ways and different intensity: fewer marriages; more cohabitation and more births outside marriage; increases in divorce, remarriage and reconstituted families; an increase in the proportion of lone-parent families; falling birth rates; and smaller average family sizes. Values about the role of the family in relation to its members have changed in parallel, which led some scholars to speak of the "**postpatriarchal family**": "This is the family formed by individuals who assert their autonomy, including children, and that at the same time needs constant coordination, monitoring, support and backup systems."³

These long-term trends, none of which were caused by ICTs as they have set in long before the arrival of the personal computer or the mobile phone, form the background against which the social impact of ICTs such as the Internet must be analysed. As van Dijk states, the individual has become "the most important node in the network society and not a particular place, group or organization. The social and cultural process of individualization, which appeared long before the Internet, particularly in western societies, is strongly supported by the rise of social and media networks. Networks are the social counterpart of individualization"⁴.

Key findings from empirical research

Discussion about ICT's impact on sociability has, for a long time, been dominated by views which were either dystopian or utopian. **Dystopians** viewed ICT-mediated communication as necessarily inferior to face-to-face interaction, which it would tend to displace. **Utopians** claimed that, by overcoming the constraints of distance, ICTs would build connections between an increasing number of people, leading to better understanding, improved social cohesion, and ultimately leading to McLuhan's famous 'global village'. Empirical research has shown that none of these views properly reflects reality.

Below the main findings about ICT's impacts on sociability are discussed along four main themes: rationalisation, networking, empowerment & participation, and lifelong learning.

² Castells (2001: 116)

³ ibid

⁴ van Dijk (2006: 168)

Rationalisation

There is comprehensive evidence that use of ICT in the domain discussed in the present report eases social interaction, i.e. has a **rationalising effect**:

- ICTs make involvement in any kind of community easier, by providing effective tools for communicating within loose networks of contacts and by participating in a wide range of decision-making processes. This applies to “**communities online**” (traditional communities originally based on face-to-face contacts, where ICTs are used as an additional tool for communication and interaction) as well as to “**online communities**” (groups in which nearly all interaction is by electronic means, and which have developed in the virtual domain rather than through face-to-face interaction).
- ICTs enable families (and other tightly bounded groups) to cope with the increasing demands arising from the typical conflicts between, on the one hand, individual autonomy and flexibility, and on the other hand, the continuous need for coordination, monitoring, support and backup systems to hold the family together.

The research findings available suggest that the Internet has been of stronger importance for the former effect, while the mobile phone has been more important for the latter.

We find considerable evidence that ICTs such as mobile phones and the Internet enable people to manage their communication more effectively; users tend to agree almost through the board that ICT tools have made their life easier and/or more interesting.

Networking and Social Capital

Recent research on social capital has demonstrated that we need to differentiate between **types of social capital** if we want to properly analyse ICT's effect on social networks:

- Bonding social capital are strong ties between like people in similar situations, such as immediate family, close friends and neighbours. These ties tend to reinforce exclusive identities and maintain exclusivity.
- Bridging social capital are more distant or “weak ties” of like persons, such as loose friendships and workmates. These ties connect individuals which have at least a core set of similarities, often related to common values, for example based on a shared work environment, hobby or ethnic background.
- Linking social capital are weak ties which reach out to unlike people in dissimilar situations, such as those who are entirely outside the community, of a different social status, or from a different cultural background.

Available empirical research suggests that ICTs have the strongest effect on **bonding social capital**, where they often help strengthen the ties which already exist – a typical example are extended families spread across great distances, who manage to stay in close touch through the Internet; and on **bridging social capital**, where the Internet has made it much easier to locate and get in touch with people who share the same interests or values. A number of studies have shown that interaction in virtual communities often leads to social ties which provide users with access to resources needed for coping with “real life” challenges. Moreover, virtual acquaintances can easily turn into “real-life” friendships. Of course, there are sizeable differences between types of ICT users. In general, younger generations are much more likely to full-heartedly embrace social uses of ICT and to integrate them seamlessly into their social behaviour patterns.

With regard to **linking social capital** (as defined above), empirical evidence is less conclusive. In general, it appears that ICTs are often used in order to strengthen ties with people who one feels close to, or those who share the same interests and background, at the possible cost of social interaction with people who are perceived to be “different”. In a social

landscape characterised by increasing social inequality and fragmentation (as appears to be the case in many EU countries), such tendencies could prove problematic.

Empowerment and participation

Existing research provides strong support for the empowering effect of the Internet, mobile telephony and other personal ICTs. For example, the mobile phone has empowered **individuals** by offering increased autonomy, "mobile intimacy", easier access to networks of choice, and a feeling of safety, all of which imply that mobile telephony is a powerful enabler for network individualisation, as described above. For small, tightly-knit **groups of people**, including **families**, ICTs have an empowering effect by enabling what has been dubbed "connected presence". There is a trade-off between empowerment of individuals, including children, and the increased possibilities offered to families. Parents need to "properly calibrate the permeable boundaries between the family and the world outside it – particularly when it comes to the protection and socialization of children". The enhanced possibilities for surveillance, available through mobile telephony, in principle allow parents to find a balance between giving children autonomy while maintaining a high degree of control.

It has also been shown that ICTs can have an empowering effect of **communities**. While ICTs may appear "space-less", in fact around three quarter of the information available on the Internet directly relate to a specific place in geographic space⁵. Researchers have found higher levels of community involvement corresponding with higher Internet usage, even after controlling for the influence of socio-demographic variables. While this appears to suggest that ICT uptake can lead to higher levels of community interaction, unfortunately most research indicates that successful ICT initiatives at local level tend to depend on a history of community cooperation and strong local social ties. It appears that social capital is indeed a pre-requisite for, rather than a consequence of, ICT mediated communication.

The topic of ICT-enabled empowerment brings up a number of issues with regard to **social participation and exclusion**. Does the increasing spread of ICTs which are used for social interaction imply that people who do not have access, or people who make inadequate use of ICTs, are at risk of social exclusion? Indeed, robust findings from empirical research indicate that Internet users benefit from personal benefits (in the form of improved access to resources) as a result of the social contact-enabling characteristics of ICTs. On the other hand, there are many examples of initiatives which successfully exploited ICT's potential for easing communication and interaction. Examples include applications for **immigrant communities**, which tend to be at risk of social exclusion in most EU countries. This is an area where public intervention seems to be called for, as many immigrant communities lack the resources to escape by themselves from digital under-development.

Finally, and not to be forgotten, ICTs also have an empowering effect for **people with anti-social inclinations**, as the use of advanced ICTs by globally operating terrorist groups has shown. Other examples include cyber-bullying. Rather than ignoring such types of use, concerted efforts should be taken to raise awareness and to supply people with the skills to protect themselves against the impacts resulting from acts of ICT-enabled anti-social behaviour.

Lifelong learning

There is evidence that learning within social networks represents a vital source of skills. People make use of their ICT-based social networks to acquire knowledge and skills, either intentionally or unintentionally. This indicates that access to knowledge, at the time of need

⁵

cf. Davies (2004)

and in a form which allows easy approbation, is a key resource which is increasingly mediated through ICTs. It suggests, again, that social inequalities in the ability to make use of ICTs need to be monitored closely, and that political action should strive to provide all citizens with ICT skills in the wider meaning of the term.

Policy implications

Policy needs to find adequate responses to a number of challenges arising from the research carried out in the domain Community & Family.

The **first** challenge to be mentioned is that – in spite of the research evidence which suggests that ICTs do at least not harm social capital – we must not forget that it is indeed highly likely that, for the majority of Europeans, a **substitution of mediated communication** for face-to-face contacts is taking place. The unintentional effects this is having on people will need to be followed closely. People in the streets communicate less with the strangers they encounter because they are indeed immersed in making mobile phone calls, reading and sending electronic messages, and generally trying to master their increasing range of (mobile) personal communication applications. Stronger dependence on mediated communication might also introduce health risks, such as those associated with exposure to electromagnetic radiation. While most research appears to indicate that this particular risk is minor in comparison to the benefits derived from mobile telephony, it will be necessary to continuously invest significant effort into observation of technology trends and usage patterns, and the negative medium to long term impacts these might have on society. The intention is not to stifle ICT-based innovations, but to enable the wider public to engage in a well-informed, open dialogue about emerging risks, and how to deal with them.

A **second** challenge is related to the use of ICTs for **antisocial purposes**. There can be little doubt that social pathologies related to Internet-based behaviour do exist. It is also certain that the Internet provides criminals and others with an anti-social disposition with tools and services which they can use to increase – sometimes radically so – the effectiveness of their deeds. There are ways how to address such threats, but they tend to affect individual rights such as data privacy and information autonomy. The societies of Europe need to seek a new balance between the freedoms and the risks introduced by ICTs such as the Internet.

A **third** major implication of our research into the social impacts of ICT is that the Internet and mobile phone, and the emerging convergence between both, present a great boost to **transparency**. While transparency is usually welcomed insofar as, for instance, people's ability to check on the activities of government and the corporate sector is concerned, it also means that personal information about individuals can more easily be exploited for unwanted commercial purposes, for exerting control, or for malicious activities of all kinds. The costs for **screening individual behaviour** have collapsed thanks to more and more human activity taking place online and/or with the help of a mobile computing device. The risk does not only concern data privacy, i.e. that personal information is made public or used without consent of the individual in question. It also concerns **users becoming prisoners of their past actions**, as the data footprint which individuals leave in cyberspace cannot easily be controlled and corrected. A typical example are teenagers, who tend to have little qualms about uploading data on personal behaviour online, risk to become victims of their exploits later, as when potential employers seek information on job candidates on the Web. As Zittrain (2008, p. 232) states, "People might make rational decisions about sharing their personal information in the short term, but underestimate what might happen to that information as it is indexed, reused, and repurposed by strangers".

Policy-makers should investigate possibilities for innovative strategies to address these problems. Some scholars have come forward with proposals for introducing an 'expiry date' for (personal) data on the Internet (Mayer-Schonberger, 2009). This would be needed in order to let society regain control over what he terms the "perfect remembering in the digital age". In the same vein, other experts have asked for the possibility of making a "clean slate"

in order to regain the ability to build a good reputation online: "People ought to be able to express a choice to deemphasize if not entirely delete older information that has been generated about them by and through various systems: political preferences, activities, youthful likes and dislikes" (Zittrain 2008, p. 229).

A **fourth** issue to be mentioned here is also related to applications of social computing. It has become obvious that Web 2.0 users risk to become overtly dependent on individual service providers, the conduct of which is naturally guided by commercial considerations rather than the public good. If this results into **user lock-in**, this will have far-reaching implications for data security, consumer rights, and the ability for market newcomers to succeed in pushing innovations. A number of much-publicised incidences, in which social networking and web mail providers lost private user data (such as archived mails), showed that data stored "in the cloud", i.e. on providers' servers rather than users' PCs, are not safe. Moreover, as commercial providers are free to change features of their social networking services as well as the conditions for their use, users may want to change to another provider which offers a more attractive service. Users may also need to look for an alternative in the case that they are excluded from using a social networking site as a result of changes to the "small print". In both cases, this would imply – under current conditions – that the person in question lost access to her personal data which she has stored on the social networking site. This appears increasingly unacceptable given the importance which users attach to their social online identity. Europe needs to explore the case for new regulation which would give users the **right of data portability**, i.e. extracting their personal data from a social networking site, for example in order to switch to an alternative service. Moreover, market players should be asked to provide more transparency about the way in which they will treat users' data in the case they shut down or sell the service, or make fundamental changes to conditions of use.

A **final** major challenge is related to the spread of ICTs and their use for social interaction is posed by its implications for **social cohesion and social inclusion**. Indeed, based on the empirical evidence taken into account so far for the present report, it remains open whether ICTs not only transform patterns and processes of sociability, but whether they also transform patterns and processes of social inclusion, as manifested in the different capability of people to make use of technology for achieving personal goals and gaining access to social (and economic) resources. In contrast, the possibility cannot be ruled out that ICTs make it even more difficult for people at risk of social exclusion to improve their situation. When what "we are witnessing [is] a new form of sociality in which the connectedness that 'matters' is determined by our distance from working communications technology" (Turkle, 2008, p. 122), policy needs to make sure that this distance is as small as possible for everybody – distance here not being limited to the geographic meaning, but also including remoteness caused by lack of skills, spending power, social status, psychology, etc.

In this context, the distinction made in our research between **different types of social ties** and social capital is of high importance. We argue that ICT has a strong positive effect on both **bonding** and **bridging social capital**, but that effects are much less conclusive with regard to **linking social capital**. Policy action at all levels of governance, particularly at the local level, should try to establish effective ways in which the potential of ICTs can be exploited for improving communication between people from different backgrounds. Examples include efforts to improve integration of ethnic minorities. The potential appears to be particularly large as far as younger generations are concerned, as these are much more likely to full-heartedly embrace social uses of ICT and to integrate these seamlessly into their social behaviour patterns. Linking social capital is vital for social sustainability in Europe, but it will not automatically be created or strengthened by ICTs. Public intervention for fostering social innovation will be necessary.

1 Introduction

The focus of the “community and family” domain is the “impact” of ICTs, in particular the Internet, mobile telephony and what has been termed “personal communication technology” (Katz & Aakhus, 2002), on **sociability** and **social interaction**. This refers to the **quality of individuals’ social relations** within their social environment, including the family and the communities they belong to. The reason for choosing our focus lies in the interest which the question about ICT’s impact on sociability has attracted in recent years not only among social researchers but also among policy-makers concerned with a wide range of topics including employment, social welfare and equality, economic competitiveness, education systems, and urban and regional development (OECD, 2001; CEC, 2003; European Council, 2003; IPTS, 2004).

Social interaction was interpreted by structural functionalists merely as a subsystem of the social system (generally seen as the nation-state). The critique on this approach is that it did not allow to get a grip on any contingencies of interaction. For this reason, we suggest to follow Katz & Rice (2002, p. 5) who defined **social interaction (sociability)** as “focused on individual relations and goals”, in contrast to civic and community involvement which is “participation in a jointly produced social, civic, or community activity”. Social interaction “entails interaction with specific others whom one either knows initially or eventually comes to know. This interaction is likely to involve dyadic, familial, friendship, romantic, and group relations. It speaks less directly to the interests and goals of collectives” (*ibid.*, p. 5).

For lack of space, the present domain does **not** deal explicitly with **social relations at the workplace**.

A special focus of the domain report lies on **social capital** because the growing interest in the notion of social capital, as reflected in the interest caused by Putnam’s influential book “Bowling alone” from 2000, revolves in particular around the question whether modernity, and the technologies that go along with it, has a detrimental effect on the quality of social interaction and social cohesion. Indeed, a question which many recent research efforts have tried to answer concerns the **impact of ICT on social capital**. The original proposition (cf. Kraut et al., 1998; Putnam, 2000) was that communication through the Internet “inhibits interpersonal collaboration and trust” and, as such, would be detrimental for social capital building and maintenance. As Kraut and his team of researchers later admitted, however, most empirical evidence collected in the aftermath of their study found that the Internet, if not strengthening existing social capital, at least is by no means detrimental to it (Kraut et al., 2002).

We define **social capital** as “... the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network” (Nahapiet & Ghoshal, 1998). The definition given presents social capital as an objective property of a situation, in contrast to Pierre Bourdieu’s conception, which describes it only as a habitualized perception of a situation among the actors, identified within the interaction. Our definition follows the use of the notion of social capital within European policy-making (e.g. CEC, 2003). See section 2.1.3.

We define **community** as a form of social organisation based on a network of individuals. These maintain relationships, which determine the extent of the community. The sense of community is created by a feeling of belonging together, whether that might be based on blood and destiny or on interest and conscious search for people alike. The founding fathers of social research into community, Tönnies and Durkheim, already stressed that social organisation is subject to a wider context of dynamics that lead to a transition in meaning of basic forms of social relationships. Community and society can not be seen as rigid institutions, they are permanently evolving and interrelated. For this reason, Barry Wellman suggests a working definition for communities which is detached from notions of community

as being spatially bounded, i.e. "networks of interpersonal ties that provide sociability, support, information, a sense of belonging, and social identity" (Wellman, 2001, p. 1).

Among sociologists there is an extensive debate about the usefulness of the notion of "community" for the analysis of modern society (Delanty, 2003; Day, 2006). In drafting the report it has been our intention not to get lost in a discussion about whether or not "community" exists in reality or whether it has only ever been a myth which is being summoned up by scholars and policy-makers if they want to contrast a presumably better past with presumably worse developments facing society in the present (Day 2006, p. 1-25). Our main focus is on sociability in different contexts, and we mainly distinguish between interaction within families, traditionally seen as the "private sphere", and interaction within people's wider networks of friends, acquaintances and neighbours, which traditionally make up the "public sphere"⁶.

The present domain report has its focus on individuals as members of communities, i.e. it covers the issue of social participation, while it excludes analysis of political participation and policy participation. For definition of these terms, we refer to the classification suggested by Meijer & Bekkers (2009, p. 100-101):

- **Political participation** denotes "actions of citizens that aim to influence the selection and behaviour of political decision-makers". It "does not only refer to influencing decision-making processes but includes agenda setting". Well-known forms of political participation include "writing letters to representatives, writing newspaper articles and organizing protests".
- **Policy participation** focuses not on agenda setting and decision-making, but on policy implementation. This refers to an active role played by citizens in public service delivery and in regulation. Citizens need civic competence to be able to participate in this way.
- **Social participation** refers to interactions between citizens rather than relations between citizens and government. All types of groups in which people join together to interact but which do not pursue directly political goals fall under this category.

Another notion which is of direct relevance to our domain concerns the **domestication of technology** (Silverstone & Hadden, 1996). It puts emphasis on the role of people in shaping the use, and ultimately the supply, of technologies by the ways in which they appropriate it in their domestic environment: "People influence the technology itself, directly as inventors and indirectly through market feedback. More important, people shape the impact that technology has on their lives by choosing which technology to use and how to use it."

In this context is important to remind us that "it is the social practices established for older media which set the parameters within which new media are appropriated into daily life. [...] While new technologies are developed, entering the households of early adopters in part according to a research agenda, more widespread use depends on their appropriation into pre-existing systems of meaning and practice" (Livingstone, 2003, p. 210-212).

In the context of the present study, we not only seek to take full account of the points made by Livingstone, but we also want to situate our analysis of ICT's impacts on sociability within a conceptual framework which takes as its venture point the *paradigmatic social trends* that could be observed in Europe over the last decades. It is to these epochal trends that we turn our attention in the following section.

⁶ For a discussion of the blurring boundary between private and public in relation to the family, see Fahey (1995) and Turow (2003)

2 Epochal Trends and the Arrival of ICTs in the Domain

2.1 Major social trends in the domain

Sociability has been at the core of public debate for as long as human beings have discussed about what's right and wrong about society and the way it is developing. Since the industrial revolution, at the latest, Europeans are concerned about the quality of interaction between people within families, neighbourhoods, urban settlements, and countries.

One of the most consistent findings from research into sociability, across numerous disciplines including sociology, ethnography, biology, medicine and psychology, is that people with stronger social networks tend to be healthier and happier (Cohen & Wills, 1985; Mirowsky & Ross, 1989; Baumeister & Leary, 1995; Diener et al., 2002; Layard, 2005; Sigman, 2009).

Theoretical as well as empirical research has found that "relationships are specialized – for instance, those who give emotional support rarely give financial support – spatially-dispersed, and combine a densely-knit core (often with immediate kin) with sparsely-knit clusters of ties with friends, neighbours and co-workers" (Veenhof et al., 2008, p. 7).

In order to explain the main social trends with regard to sociability and community, it is necessary to briefly recall the most important developments over the last centuries.

2.1.1 Community

"Gemeinschaft" und "Gesellschaft" – The transition from traditional to industrial societies

Ferdinand Tönnies' (1887) concept of differentiation between *Gemeinschaft* (community) and *Gesellschaft* (society) was based on his observation of a transition within social organisation: from traditional community based social environments into industrial societies. Communities in his view were characterised by moral unity, rootedness, intimacy and kinship (Broom & Selznick, 1973) and thus were homogeneous in the sense of social conformity and local customs. He distinguishes between 'communities of blood', 'of locality' and 'of mind'. All three types can be seen as heavily interrelated and able to create a strong sense of community, which is one essential aspect for the personal identification with a community. His view on the development towards an industrial society was pessimistic, as he has seen the values of communities going lost in more rational, impersonal urban societies.

The work of Emilé Durkheim concentrated on the meaning of solidarity and how it changed with the evolving industrial state. In his thesis from 1893 he introduced two basic types of solidarity: mechanical and organic solidarity. Mechanical solidarity is seen as an element of traditional social relationships, based on destiny and substantial similarities. Thus a strong feeling of belonging together is developed and the collective becomes a value, which might cause individuals to lose their own will and act mechanical in terms of solidarity. As societies become more complex and individual identities lose their fateful anchors, also the type of solidarity changes. Individuals have to search for people alike and become more focused on similar interest to orientate their choice of community on. Nevertheless, a sort of reciprocal dependency among members of a community is created. This demands an organic solidarity, which allows heterogenic elements work together as a single unit.

Like Tönnies, Durkheim also sees certain dangers evolving with the rapid transition from traditional to industrial society. The accelerated social change might lead to an ethical disorientation, where people lose their trust in social institutions and norms. Thus social bonds are eroding, before an organic form of solidarity can catch up. He later develops this thought in his work about suicide (1897), in which he looks at the social circumstances involved that provoke the act.

Both of these early works already stress two essential dimensions of community: the **social structure** and the **sense of community**. A community is a form of social organisation based on a network of individuals. These maintain relationships, which determine the extent of the community. The sense of community is created by a feeling of belonging together, whether that might be based on blood and destiny or on interest and conscious search for people alike. Tönnies as well as Durkheim stress that social organisation is subject to a wider context of dynamics that lead to transition in meaning of basic forms of social relationships. Community and society can not be seen as rigid institutions, they are permanently evolving and interrelated.

Community in modern societies

Whether the community concept is still appropriate for understanding processes in modern societies is heavily contested. The discussion basically revolves around the question whether community is in the process of being 'lost', 'saved' or 'liberated' (Wellman, 1979).

The 'community lost' perspective is often connected to the loss of public space in urban areas (Wellman, 1979; Oldenburg, 1989; London, 1997). The argument follows Tönnies' prediction that increasing urbanisation enhances rationalisation and impersonal social linkages. It is assumed that the physical space still holds an important role for developing a collective identity. The lack of public space, especially in modern suburbs, and the increasing retreat of people into their heavily mediated homes, where they spent hours in front of the television instead of socialising, makes people become strangers, as they are increasingly separated in their interests and activities. Projected on the impact of ICT, it is concluded that the significance of place and thus the physical basis for communities is likely to be threatened (Meyrowitz, 1985).

Nevertheless, arguments can be found that modernisation has taken place, but communities can still be found in urban areas and are thus saved from progressing rationalisation. Crow & Allan (1994) argue that community life, in its local manifestation, still plays a vital role in our social existence. It frames activities such as shopping, working or meeting neighbours. Local communities hold the role of a mediator between households and macro-scale social structures.

Reflecting changes within social organisation in modern societies, Barry Wellman (1979) developed the 'community liberated' argument. This perspective sees community from a network analysis point of view and is thus able to imply more heterogeneous and disperse types of communities. Timm (1972) describes the urban world as a mosaic of social worlds with increasing mobility and a weakening meaning of location. Hence, people's sense of community is less limited by physical boundaries and kinship. Modern 'personal communities' (Wellman, 1996) do not depend on spatial density and are marked by specialisation, "...with different ties providing different types of resources." (Wellman, 1997). People do not belong to one community only, but are member of different types of specialized communities, which can be described as a set of personal communities. Social organisation takes the form of 'networked individualism': networks have become so differentiated that the individual case cannot be seen as the lowest level of a clear-cut, group-based social system, but as a field of overlapping individualized networks (Castells, 1998; Wellman, 2001). People are involved in sets of narrowly defined relationships with changing network members – there is no single community as the only source for identity.

Another position is taken by Cultural Studies, which interpret individualization as a growing choice for individual to select role models, on the one hand, and a change of the public sphere on the other. The related diversity of frames of reference for the individual allows for the articulation of new ways of life. Wellman points at the necessity to identify and analyse such processes under the perspective of possible inclusion/exclusion processes. Lave & Wenger (1991) address their impact on learning.

2.1.2 Family and the Individual

Kiernan (2003), in her review of the developing pattern of family change in recent decades, highlights the following major demographic changes which have been observed throughout Europe, although in different ways and different intensity: fewer marriages; more cohabitation and more births outside marriage; increases in divorce, remarriage and reconstituted families; an increase in the proportion of lone-parent families; falling birth rates; and smaller families.

Marriage

Since the early 1970s, the general European pattern has been declining marriage rates and rising mean age at marriage. Comparing between countries, this trend has showed first in the Nordic countries (in the late 1960s) and latest in the countries of Southern Europe, where it became evidence in the late 1970s.

In a related development, cohabitation especially among young couples, as a prelude to, or as an alternative to, marriage, started to spread in the 1970s and escalated in the 1980s and 1990s. The trend has continued to the present day. Apart from some countries which have developed furthest from the traditional marriage patterns (Prinz, 1995), most national data show that unions of unmarried couples living together tend to be less stable in the medium to long term than marriages. "After five years, only a minority of cohabiting unions remain intact: they have either converted into marriages or dissolved" (Kiernan, 2003, p. 20). Young people tend to experiment more with partnerships, including cohabitation, before getting married or not marrying at all.

Becoming a parent

"In modern, low-fertility societies the few births which couples or individuals have are usually tightly clustered in a period of a very few years [...]. Across Europe parenthood is being entered into at increasingly old ages, higher proportions of men and women are remaining childless, and an increasing proportion of children are being born outside of marriage" (ibid ., p. 21).

On average, Europe has the lowest fertility rates in the world. While the overall trend is the same across all Member States, there is considerable variation in the timing and the extent of the decline.

While most young women still want to have a child at some stage, and most couples also do not expect to remain childless, the trend towards older parenthood also means that rates of childlessness have been rising: "Childlessness emerges from a series of decisions to postpone having children" (Kiernan, 2003, p. 23).

The last few decades have also shown a trend towards severance of marriage and parenthood: More children are born outside of marriage, but this does not necessarily mean that more children are born outside a partnership).

Family dissolution

Rates of divorce in Europe were very stable throughout the 1950s and early 1960s, but then started to increase in almost all EU Member States, with highest rates of increase seen in the 1980s. Since then the main trend has been stabilising divorce rates. These developments were heavily associated with changes in regulation: "Between 1960 and the mid-1980s divorce policy was either completely revised or substantially reformed in almost all Western countries" (ibid., p. 26). Still today, there is a lot of variation across European countries' divorce rates.

In spite of divorce becoming common-place across Europe, divorce statistics are still heavily underestimating the number marital dissolutions, not to speak of the number of partnership dissolutions (*ibid.*, p. 27).

Higher rates of divorce also imply a higher incidence of a separation of child-bearing with child-rearing for at least one of the parents, typically the father. Numbers of lone-parent families have been increasing considerably, with the large majority of them being headed by the mother. Whereas lone-parent families used to stem mostly from marital breakdowns, this appears to have changed more recently in some European countries such as Sweden and Denmark, where never-married women with children have become much more common.

Along with the much higher rate of divorce, in Europe today there are also many more remarriages than before the 1980s.

"As a consequence of these demographic changes children are increasingly experiencing a variety of family settings as they pass through childhood and adolescence" (Kiernan, 2003, p. 29).

The post-patriarchal family

"European men and women are having children later in their lives because they have more life choices combined with highly effective means of controlling their fertility [...] The increased participation in higher education and training that has occurred in most European nations [...], as well as accrual of qualifications to meet the demands of modern economies, have led to an extension of the period of dependency in the third decade of life. Consequently, the time span of the transition to adulthood, from leaving education, entering the labor market and marrying and becoming parents has become more protracted" (Kiernan, 2003, p. 30).

Castells (2008, p. 448) calls the resulting type of family, which has come to dominate society in most EU countries, the "postpatriarchal family": "This is the family formed by individuals who assert their autonomy, including children, and that at the same time needs constant coordination, monitoring, support and backup systems."

One consequence of the change in family patterns, in combination with the effect of rising incomes, dynamic real estate markets, the availability of publicly provided long-term care and longer time spent in education, has been that average household sizes have declined and numbers of single-person households have dramatically increased since WW II.

For describing the transformations which families have undergone in recent decades, many scholars make reference to Zygmunt Bauman's theory of "liquid modernity" (Bauman, 2000, 2005). Based on this notion, Branco & Pedroso (2008, p. 2) propose the term "liquid families":

More and more, family tends to transform itself from a permanent and total experience into a partial and transitory experience of individual life. Or, paraphrasing Bauman, we are confronted with a new family model: liquid family. By being "limitless" (unconfined), it transforms itself into "families", pointing to all the variety and multiplicity of family experiences, resulting from the voluntary choices of the individuals [...]. Thus, we are confronted with new flexible and fluid family scenarios: de facto partnerships increase; monoparental families increase; recombined families increase; transnational families increase; and unipersonal families have also increased; and the number of children born outside the wedlock has increased heavily. Such scenarios are a result of the following factors: the nuptial rate decrease; the conjugal instability augmentation (resulting in separation and divorce); the birth-rate drop; migration processes and globalization. Consequently, we are dealing with the weakness of the matrimonial union and of the "family institution" [...]. Nevertheless, more than discussing a "family crisis", we should speak of a crisis affecting a precise family model, i.e., the stable, harmonious, affective and fecund family, regulated by a rigid role division and settled upon a hierarchy between man and woman, parents and children. Thus, in a context marked by flexibility and fluidity,

the prevalent model is still the nuclear family, not always put forward in accordance with symmetry and democracy. Yet, this is no longer the referential followed by a large number of people, at least in some of their life phases. This is why we can no longer speak of a univocal definition of family.

Individuals in late modernity: Increasing choice, increasing pressures, increasing risks

These trends in family and partnership dynamics are indicative of broader changes in the relationship between individual and society, public and private, and predestination and freedom, which are characteristic of the times we live in. There have been various attempts, mainly by sociologists, to explain major trends in society by placing them in the context of comprehensive theories of modernity and post-modernity.

Ben Agger (2004) discusses the notion of instantaneity, by which he means the erosion of boundaries and the way time and space are compressed: "Instantaneity breaks down boundaries and barriers, bringing about a kind of dedifferentiation, which some say is the hallmark of postmodernity" (Agger, 2004, p. 7).

Today, individuals face the responsibility to construct an explicit project of the self, although taking account of the boundaries set by socially regulation and approval. This brings new freedoms but at the same time a heightened sense of responsibility and a widespread awareness that one is thrown on one's own resources.

As Ulrich Beck (1994) argues, the diversification and individualization of life worlds and lifestyles potentially introduce both new opportunities and new dangers: "New kinds of risk feature as both unacknowledged conditions and unintended consequences in the process of connecting the local and the global by means of modern communication technology" (Slevin, 2000, p. 13).

The implications of the individualization trend can be exemplified by highlighting some of the recent changes with regard to the role of children in family and society.

Indeed, some experts have noted that the increase of demands being placed on women and men – by society as well as by their own pursuit for autonomy – is starting to apply to children as well. Some see here "the abolition of childhood": "We are, in effect, reverting to premodern conceptions of the child [...]; we have broken down barriers separating family from society in such a way that we have come to expect children to be adults. This is manifested in sexuality, schooling, sports, and what one might loosely call wordliness" (Agger, 2004, p. 92). While the extent to which childhood can be considered as being abolished is debatable, there is certainly much consensus that childhood has become abbreviated as a result of a number of related trends: Children become sexualised earlier (Moore, 1993); are to a larger extent expected to take autonomous decisions as consumers and citizens (Livingstone, 2003) and have become subject of direct marketing activities from a much earlier age on (Turow, 2003); and, in school education, face increasing demands to adapt their learning to the demands of the (labour) market place in which they will eventually be integrated (Agger, 2004).

Related to this, Katz (2003, p. 47) puts the emphasis on what he sees as the "disintermediation of parents": "The traditional (extended) family used to be an educational organisation, a unit of production and consumption, a religious and political clan. One by one, these functions have been transferred from the family to other institutions, leaving the family to serve functions of consumptions, caregiving, and socialisation. But even these functions are in dispute [...]", as late capitalist consumer society and the institutions of the state are "reaching over the heads of the parents".

Buchner (1990, p. 77-78) adds that "every child is increasingly expected to behave in an 'individualised way' [...]. The more childhood in the family is eclipsed by influences and orientation patterns from outside the family [...] the more independent the opportunity (and

drive) to making up one's own mind, making one's own choice [...] described here as the biographization of the life course".

At the same time, however, adulthood is arguably being postponed in the sense that children stay economically, and often emotionally, dependent on their parents for a longer period of time (Nave-Herz, 2002). "Arguably, we are observing contradictory trends – both towards the autonomy of children, domestic democracy and individualization of childhood and towards increased regulation and risk management of children by adults" (Livingstone 2003, p. 217).

Livingstone (2003, p. 215) sums up some of the major social trends affecting young Europeans as follow:

As traditional structures, at all levels from the family to the nation-state, which confer identity are being undermined, others are actively sought [in particular] by young people, and these are readily being provided by the market. The integration of individualization and consumerism is also an increasingly globally structured process, transcending national boundaries. This makes for a heady context within which young people seek to construct a meaningful life project which is more or less shared with their peers, conceived locally and globally, in actuality and virtually [...].

2.1.3 The debate around “social capital”

When discussing sociability and community, the notion of **social capital** has become a key term in recent years. It has attracted much interest in the public debate, in particular with regard to strategies for fostering economic and social development in the Information Society and Knowledge Economy.

Use of the term “capital” was originally limited to “an accumulated sum of money, which could be invested in the hope of a profitable return in the future” (Field, 2003, p. 12). The concepts of “physical capital” (machinery, buildings, etc.) and “human capital” (workers and their skills) followed later in order to allow economists to measure the value of individual factors of production, including human skills. For the development of the concept of “social capital”, contributions mainly from three scholars have been most important, namely Pierre Bourdieu, James Coleman and Robert Putnam.

The main motivation behind inventing the term “social capital” was to put emphasis on the importance of (the quality and quantity of) **relationships** between people for explaining social and economic outcomes. Social capital is usually understood as:

... the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital thus comprises both the network and the assets that may be mobilized through that network (Nahapiet & Ghoshal, 1998).

Understood in this sense, social capital can be compared to other forms of capital in that it can be **invested in**, it can be aggregated or **built up**, resulting in a stock of social capital (both individually and as a community), and it can be **used as a resource** for helping achieve certain outcomes, including economic ones. Moreover, social capital can be **depleted**, for example by over-using the help of an acquaintance without giving enough back in return, which refers to the core role played by **reciprocity** in social relations.

Schuller et al. observed in 2000 that the key benefit of the notion of social capital lies in the way in which it shifts the focus of analysis from the behaviour of individual agents (individuals, firms, public agencies) to the **pattern of relations between agents, social units and institutions** (Schuller et al., 2000).

In general there is the assumption that social capital has positive effects not only on those who "own" it, but also for the community (region) at large⁷. This is due to the externalities generated by social behaviour, which often have the form of network externalities (Iyer et al., 2005). High stocks of social capital in a region are associated with relative ease of the sharing of knowledge and expertise, with community building and social cohesion.

Whereas the notion of social capital has generally been considered in the policy process as something positive for those who are endowed with it), closer analysis reveals that there is a need to distinguish between different types of social capital if the purpose is to identify structures and developments which are conducive to economic development.

Indeed, newer research has stressed that social capital can have negative as well as positive effects with regard to, in particular, the ability to innovate and to respond to complex, changing environmental conditions (Florida, 2002). A number of researchers have emphasised the possibility for "dysfunctional behaviour within tight-knit social networks" and the superiority of weak ties over close ties for regional social innovation (Portes, 1998). Huysman & Wulf (2004) list the following potential problems in relation to networks which are characterised by strong bonding capital: "restrictions imposed on actors who do not belong to the network; a lack of perception concerning environmental changes outside the network; negative social dynamics within the network and a downward levelling of norms; a dependency on central actors and their loyalty toward the network; restrictions on autonomy and individuality resulting from demands for conformity; irrational economic behaviour due to a feeling of solidarity toward partners in the network; irrational economic behaviour due to personal aversion". We conclude that any attempt to compare or benchmark regional systems according to the strength of social capital accumulation should be careful to take account of the possibility of both positive and negative impacts of networks characterised by "close ties".

The distinction between strong ties and weak ties was originally suggested by Granovetter who in the early 1970s famously proclaimed "the strength of weak ties" and pointed towards the increasing importance of weak ties for success in social and economic domains (Granovetter, 1973). The term "weak ties" might be misleading, though, as "the essential characteristic of [this kind of] social capital is not its weakness or strength but rather its extensiveness and inclusiveness" (O'Brien et al., 2005). In order to avoid such confusion, Woolcock (2001) proposes distinction between three types of social capital:

- **Bonding social capital**, i.e. strong ties between like people in similar situations, such as immediate family, close friends and neighbours. These ties "tend to reinforce exclusive identities and maintain exclusivity" (Field 2003, p. 32). Strong (bonding) ties do not rely on physical proximity – although they tend to be fostered by it. A typical example of bonding ties which stretch across distance are family ties.
- **Bridging social capital**, i.e. more distant or "weak ties" of like persons, such as loose friendships and workmates. These ties connect individuals which have at least a core set of similarities, often related to common values, for example based on a shared work environment, hobby or ethnic background. An example of bridging ties has been presented by James (2005), who studied Mormon communities in the USA and found that strangers quickly entered into trust-based relationships once they realised they belong to the same religious faith, i.e. Mormonism.
- **Linking social capital**, i.e. weak ties which reach out to unlike people in dissimilar situations, such as those who are entirely outside the community, thus enabling members to leverage a far wider range of resources than are available within the community.

⁷

See for example: Parissaki & Humphreys (2005).

We will use this distinction between three different types of social capital in the remainder of the present report. As will be shown, the impact of ICT on social capital – as far as can be deducted from available research findings – differ considerably between types of social capital. This has important implications for policy making (see section 0.1).

In parallel to the discussion about a proclaimed “demise of community”, described in the previous chapters, many observers have stated that levels of social capital have been decreasing in recent decades due to the rise of individualism and the “atomization of the social” (Delanty, 2003, p. 193). Most prominent among these voices has been Robert Putnam (1993; 2000), whose research focused on Italy and the USA. He tried to show, using a wealth of statistical data, that levels of social capital had been in constant decline in the USA since the 1960s. For this trend, Putnam identified two main culprits, namely television and generational change (cf. Field, 2003, p. 29-40).

In the last ten years or so, the academic community has shown huge interest in the notion of social capital, which has resulted in much better understanding about the complexities of the issues involved. Both Woolcock (2001) and Lin (2001) have shown that Putnam does not sufficiently differentiate between types of social capital. While there is, indeed, strong evidence that levels of bonding social capital have decreased in western countries in recent decades, the same can hardly be said about bridging and linking social capital. Moreover, social capital can by no means always be considered to be benign; bonding social capital, in particular, can help reinforce inequality and support antisocial behaviour (cf. Huysman & Wulf 2004, p. 6-7).

Against this background, there is now increasing consensus among social capital researchers that “different combinations of the three types of social capital will produce different outcomes” (Field 2003, p. 42), and that the relative value of weak ties as a resource has increased since the 1960s. This is because, in the economic domain, success is based more and more on the ability to perform in flexible, fast-changing networks that stretch across the boundaries of organisations, locations and cultures⁸; while in the social domain, people need to cope with the demands of “liquid life”, to use Zygmunt Bauman’s (2005) phrase.

Some scholars have argued that linking social capital, in particular, may be undersupplied in many parts of the EU: “In many countries, both developed and developing, such [linking] social capital is considerably under-provided and it has been argued that without such social capital, the opportunities for social exchange are lowered and the potential for destructive conflict is raised” (Iyer et al., 2005).

Results of research carried out in Finland suggest that there are indeed sizeable differences between high-performing and structurally weak regions in terms of stocks of linking social capital (Nurmela, 2006). Based on research evidence presented in his book, Richard Florida (2002) suggests that cities, regions and countries that want to successfully participate in the knowledge-based economy need to be supplied with sufficient amounts of bridging and linking social capital.

2.1.4 Conclusion: Towards network individualisation

As Castells (2001) reminds us, the Internet and the community-building which takes place in cyberspace need to be interpreted as exacerbating a well-established trend in western industrialised countries, i.e. “a historical process of separation between locality and sociability in the formation of communities: new, selective patterns of social relations substitute for spatially bound forms of human interaction” (*ibid.*, p. 116). The change in the

⁸ This also relates to the increasing importance of tacit knowledge and its transfer in the knowledge-based economy and society.

types of social capital which are sought, certainly enabled by the Internet and other ICTs, has its root in a growing diversity of sociability patterns which are themselves not caused (primarily) by any technologies.

Social researchers agree that individualisation has for many decades been the dominant trend in the evolution of social relationships in Europe and beyond (Inglehart, 1997). Against this background it has been suggested to describe the evolving patterns of sociability in the network society as "network individualism" (Wellman, 2001) or "networked individualism" (Castells, 2001) with the nuclear family in the household at its core, "from where networks of selective ties were built according to the interests and values of each member of the household" (*ibid.*, p. 116). Van Dijk (2006) prefers the term "network individualisation", which he describes as "the individual [...] becoming the most important node in the network society and not a particular place, group or organization. The social and cultural process of individualization, which appeared long before the Internet, particularly in western societies, is strongly supported by the rise of social and media networks. Networks are the social counterpart of individualization" (*ibid.*, p. 168).

With regard to national (or even regional) differences concerning the social impacts of ICT, it is worth noting that the long-term social process of individualisation does not occur in the same way and at the same speed in all countries of Europe. Different theories exist with which to explain such cultural differences between countries and how these change in time. Geert Hofstede (2001) considers "national culture" as a set of collective beliefs and values that distinguishes people of one nationality from those of another. His view perceives national cultures as extremely stable, which "can be explained from the reinforcement of culture patterns by the institutions that themselves are products of the dominant cultural value systems" (Hofstede, 2001, p. 255). Even if cultures shift in the long run, "they shift in formation, so that the differences between them remain intact" (*ibid.*). In Hofstede's theory, one of the main dimensions of national culture is individualism, which he then set out to measure using a by now well-established set of variables to be applied in structured personal interviews.

A different view is held by Inglehart (1997) and his followers, who use data mainly from the World Value Survey. As opposed to Hofstede's approach, which is informed by cultural theory and stress on path dependency, Inglehart is more indebted to modernization theory, which argues that processes of economic and social development lead to cultural convergence (Kerr, 1983). This would imply that the "human development sequence" logically leads to increasing individualisation in all countries. In his more recent work, Inglehart acknowledges that there might be no real convergence (Inglehart & Welzel, 2005), but that nations develop in parallel, more or less quickly depending on their individual economic growth path, towards modernisation.

2.2 *ICT implementation in the domain: Common expectations and first practice*

We can distinguish between two basic points of view concerning the impact of computer networks and other ICTs on sociability and social interaction:

The **dystopian view** is represented by Putnam's work on the presumed collapse of the community in post-war United States. While his influential book "Bowling alone" does not deal with ICTs in depth, Putnam (1998) still expresses his belief that the Internet "inhibits interpersonal collaboration and trust" and, as such, would be detrimental for social capital building and maintenance. Statements such as this are based on the assumption that ICT-mediated communication is substituting for face-to-face communication, a development which would necessarily lead to the impoverishment of social interaction since "mediated communication always involve particular restrictions" (van Dijk, 2006, p. 211). Indeed, for a long time research of computer-mediated communication (CMC) was based on such deficit approaches (Thurlow et al., 2004), which were themselves grounded on social presence

theory, reduced social context cues theory and media richness theory (van Dijk, 2006, p. 13-16). All of these appear to support claims that ICT-mediated communication is necessarily inferior to face-to-face interaction, which “was considered to be the norm and [provide] the best quality of communication” (*ibid.*, p. 226).

In contrast to the dystopian approach, the **utopian** view as represented by McLuhan (1966), Toffler (1980), de Sola Pol (1983) and Negroponte (1995) claims that, by enabling the creation of network connections between an increasing number of individuals and organisations, ICTs bring people together and improve social cohesion, ultimately leading to McLuhan’s famous ‘global village’.

The utopian view was also predominant among the comparatively small group of highly educated individuals who made up the avant-garde of computer network users (Castells, 2001; Tuomi, 2002). This group shared, to a large extent, a set of common values revolving around free communication, absence of central control and collaborative development of both infrastructure and content of the emerging worldwide computer network. These values found application in the first virtual communities on the Internet, such as the Usenet, which was conceived in 1979 and offered users the possibility to read and post public messages to one or more newsgroups. Another early online community, the WELL, which went online in 1985, counted Howard Rheingold among its early members. The experience inspired Rheingold to write his influential book “The Virtual Community”, published in 1993.

In the academic sphere, in the second half of the 1980s – in reaction to the claims of the classical research on CMC which had been based on the deficit approach – “a more social-cultural or sociological approach emphasizing (inter)subjective social construction processes has appeared” (van Dijk, 2006, p. 14). The theoretical foundation was supplied in form of the ‘social information processing model’ (for an overview see Fulk & Steinfield, 1990). As a reflection of the emerging evidence on how computer networks, e-mail and the Internet are actually used by people, researchers began to notice that “media are used differently in relation to particular functions (tasks, goals) and contexts (van Dijk, 2006, p. 14). In fact, the research of Walther (1996) suggested that “after some time the quality of CMC approaches that of face-to-face communications. This conclusion is diametrically opposed to the claims of the social presence and reduced social cues approaches” (*ibid.*).

Both the dystopian and the utopian views have continued to be present in the public debate about ICTs’ influence on sociability, with variations across time depending on the common preconceptions of every given period.

Turow & Kavanaugh (2003) report from a study into the way the Internet’s relationship with the family has been publicly written about in the 1990s. They found that 97% of the reports about the issue discussed it in terms of the problems and/or benefits of the web. “The researchers concluded that the press presented the internet as a Jeckyll-and-Hyde phenomenon. They saw the overall message as ‘Your children need the internet. But if they do go online, be terrified’” (Turow & Kavanaugh, 2003, p. 11). And indeed, most studies of parents’ opinions and behaviour regarding their children’s use of the Internet show that “the rush to connect to the web was happening despite parents’ substantial insecurities about it” (*ibid.*; cf. Turow & Nir, 2003).

The public debate about the social effects of ICTs such as the personal computer, the Internet and the mobile phone mirrors to a very large extent similar debates which arose in earlier times about the arrival of movies, radio, and television (Anderson & Evans, 2003). This makes Wartella & Reeves exclaim (2003, p. 64) that they “are impressed by the overwhelming similarity in the research studies from epoch to epoch, with a new technology substituted as the object of concern”.

A major difference, however, is that the older media gave rise to concerns that the “new one-way mass media encouraged people to be mere spectators who were not directly active in shaping events” (Turow & Kavanaugh, 2003, p. 14), whereas much of the Internet’s and

mobile phones' appeal rests on them being used to provide people with new ways to connect with each other.

Indeed, with the arrival of online social networking platforms and other so-called Web 2.0 applications, public interest has increasingly focussed on the ability of ICTs to create fundamentally new possibilities for socialising. As a result, today most participants in the public debate (again) tend to hold optimistic views about the impact of the Internet and personal mobile communication on social capital.

Another set of issues, however, has remained very much topical, namely the effect which mediated representation has on users (especially children), as well as the effect which mediated communication has on the quality of the interaction and on privacy. As Turow & Kavanaugh (2003, p. 22) remind us. "we can find nervousness about children's inability to distinguish between fact and fiction as far back as Plato's *Republic*".

Surprisingly many of the same fears about the isolating effect of television have re-emerged with the Internet, one reason being that "the Internet is less likely than the television to be a shared medium. Unlike television, Internet content tends to cater to the specialized interests of family members" (Jordan, 2003, p. 149). After a long history of being condemned as the chief culprit in destroying sociability (cf. Putnam, 1990), it appears amazing that the television-centred family life is now, as a new wave of technologies is sweeping across the world, being heralded as a lost idyll of joint activity in the home. Have it really been better times when "television [...] brought the family together around the hearth" (Livingstone, 1992)?

3 Applications of ICT in the Domain

Below we will briefly present the main ICT applications which have spread widely in the social domain in the last 20 years or so, and which have been at the core of research on the social impact of ICTs on users, as well as society at large. The description is not meant to be comprehensive.⁹

3.1 Internet-based applications

Below we will just briefly outline some of the main ICT applications which are of major interest for the discussion of "social uses" of the Internet and the impacts these have on communities, families, and society at large. For a more comprehensive overview of applications and related technological trends, readers are referred to the specialist literature.

One of ICT's killer applications has been, without doubt, **e-mail**: It drives people online just to be able to participate in electronic communication. The reasons are, of course, well established. First of all, e-mails are fast and easy to send compared to the more laborious regular mail or fax. Transmission times are (mostly) extremely short, which enables almost synchronous communication. Costs for sending e-mails are very low. Equally important, due to full digitisation e-mail allows unprecedented levels of reusability, documentation and integration with other communication channels (e.g. copy-pasting text to other applications; multiple recipients; message forwarding; free text search in e-mail archives). By the use of file-attachments, not only messages but also every other kind of digitised information (data files) can be transmitted through the same channel. Last but not least, as an Internet

⁹ A more in-depth coverage of ICT applications in the social domain can be found in: OECD (2007); Pascu (2008); Ala-Mutka (2008); Lindmark (2009)

application, e-mail accounts can in principle be accessed from any location where there is an Internet connection.

Apart from e-mail, other applications of the Internet were – in the first years after the arrival of the World Wide Web – mainly used, as far as private use is concerned, in ways which focus on information retrieval and on transactions, e.g. for e-commerce and e-banking. The social impacts which can be expected from such “Web 1.0” uses are mainly to be found in increases in convenience and in easier access to a broader range of information sources¹⁰.

This has changed with the arrival, in the last 5 years, of so-called **Web 2.0** technologies. Other terms being used in this context are **the participative web** (OECD, 2007), and **social computing** (cf. Pascu, 2008). All of these terms are mostly understood to include blogging, sharing of photos, videos and other media content (including user-created content), social networking, Wikis, social gaming and social tagging. Broader definitions also include more well-established types of online participation, such as online discussion groups and fora, chat sites etc. (cf. OECD, 2008b). Discussion of Web 2.0 applications often also covers the increasing importance of collaborative content (cf. Ala-Mutka, 2008), including what Benkler (2006, p. 59-90) calls “commons-based peer production”. The latter has found widespread application, in particular, in software development (e.g. open source software).

Blogs (derived from "weblog") is a type of website which is maintained by an individual who regularly uploads entries of commentary, descriptions of events, or other material such as graphics or video. Many blogs can be described as personal online journals, while others provide commentary or news on a particular subject of interest. The ability for readers to leave comments in an interactive format is an important part of most blogs. A typical feature is the heavy use of hyperlinking to related websites and other blogs, which led to the term “blogosphere”, i.e. a sort of ecosphere which is made up of all blogs and the interconnections between them. Blogging has been discussed extensively as an enabler and expression of a rise in participatory journalism (as opposed to the traditional separation of roles between the mainstream media and media consumers). Blogging can also be a means of ‘getting around the filter’ and pushing messages directly to the public, which in turn has led to critical voices who stressed that society cannot easily do without the filter role played, for example, by journalists (Keen 2008).

Online social networks are websites where members can store information about themselves, typically in the form of profiles, and make contact with other members, thus creating a network of personal connections. In addition, **user-created content** (UCC) can be uploaded by anyone, such as texts, photos, music files and video clips, which often act as the centre for interaction within the network (e.g. YouTube, MySpace). Social networking may take place anonymous or with real personal data. Members of social networking sites may be identified by their real names and data, but this is not the norm. Information provided often includes photographs and CVs. Members’ networks of connections are displayed as an integral piece of their self-presentation.

Sites which heavily feature user-created content are among the most popular online sites today, but a number of studies have shown that only a minority of site users are responsible for contributing nearly all of the content (Ala-Mutka, 2008; Fisch & Gscheidle, 2008). A report from the OECD (2007, p. 18) identifies three core characteristics of UCC:

- **Publication requirement:** The work is published in some context, for example on a publicly accessible website or on a page on a social networking site only accessible to a select group of people (e.g. fellow university students). This characteristic excludes e-mail, two-way instant messages and the like.

¹⁰ See the Domain Report on Consumption

- **Creative effort:** A certain amount of creative effort has to be put into creating the work or adapting existing works to construct a new one; i.e. users must add their own value to the work. Examples include original photographs, thoughts expressed in a blog or a self-created music video. The creative effort behind UCC may also be collaborative, for example on websites that users edit collaboratively. Merely copying a portion of a television show and posting it on an online video website (a frequent activity on UCC sites) would not be considered UCC. Nevertheless the minimum amount of creative effort is hard to define and depends on the context. This is a much contested issue, mainly between traditional rights holders and champions of "free culture" (Lessig, 2004).
- **Creation outside of professional routines and practises:** UCC is usually created outside of professional routines and practices. It often does not have an institutional or commercial market context and UCC may be produced by non-professionals without expectation of remuneration or profit. Motivating factors include: connecting with peers, achieving fame, notoriety or prestige, and expressing oneself (cf. Benkler, 2006, p. 92-99).

Wiki software is a type of collaborative software program that allows web pages to be created and collaboratively edited using a common web browser. Such websites are referred to as "wikis"; they allow for easy creation and editing of any number of interlinked Web pages. Wikis are typically used to create collaborative websites, the most popular of which is, of course, **Wikipedia**. The essence of the Wiki concept has been summarised as follows:

- "A wiki invites all users to edit any page or to create new pages within the wiki Web site, using only a plain-vanilla Web browser without any extra add-ons;
- Wiki promotes meaningful topic associations between different pages by making page link creation almost intuitively easy and showing whether an intended target page exists or not;
- A wiki is not a carefully crafted site for casual visitors. Instead, it seeks to involve the visitor in an ongoing process of creation and collaboration that constantly changes the Web site landscape" (Leuf & Cunningham, 2001).

The rapid growth of Wikipedia and its popularity among large shares of Internet users have been well documented elsewhere.

Social gaming refers to **virtual environments** such as SecondLife. SecondLife provides a virtual representation of real-life artefacts and events in which people can perform similar activities as in real life. The rules of the SecondLife are corresponding to its real-world counterparts and the events may be (on-line) representations of the real events like a conference or a panel discussion that can be followed either in real life or in virtual.

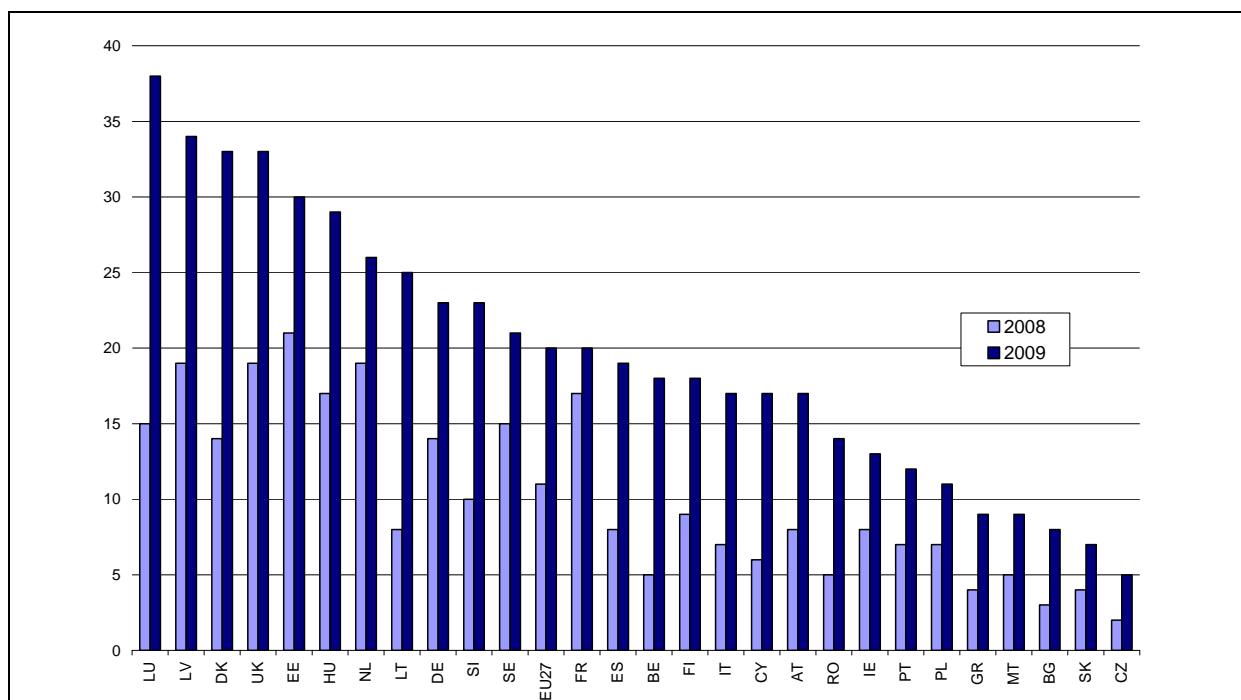
Social tagging, which creates **Folksonomies** (a term first coined by Thomas Vander Wal in 2004), denotes "personal free tagging of information and objects (anything with a URL) for one's own retrieval. The tagging is done in a social environment (usually shared and open to others). Folksonomy is created from the act of tagging by the person consuming the information" (Vander Wal, 2007). Use of tagging in online social networks has continued to increase in popularity since 2004. There are also innumerable blogging sites that employ tagging.

Social tagging is an example of "peer-produced information, knowledge and culture" (Benkler, 2006, p. 5), which more generally refers to automatic taste matching, recommender and reputation systems which are increasingly being applied not only for commercial purposes (on e-commerce websites), but also for helping users identify relevant news and form their opinion. For describing the resources provided by such peer-production, Resnick (2005) suggests the term **sociotechnical capital**, by which he means "productive resources that inhere in patterns of [impersonal] social relations that are maintained with the support of ICTs".

While the Internet has long been viewed as a virtual space detached from physical places, one of the types of online applications which have spread most rapidly in recent years is **geographic information platforms**. Online services such as Google Maps and Google Earth make it possible to visualize, annotate and share geographical information of all types with unprecedented ease and effectiveness. Today, most applications of this type can be found in the form of mash-ups, which allow users to visualise the geographical dimension of any type of information.

The latest Eurostat data on the spread of user-creation of online content are presented in Figure 1. They indicate the significant share of adult Europeans who engage in contributing own content to the Internet. In Luxembourg, Latvia, Denmark and the UK, more than one in three adults are doing so. The EU average is 20%, almost twice as many as the year before.

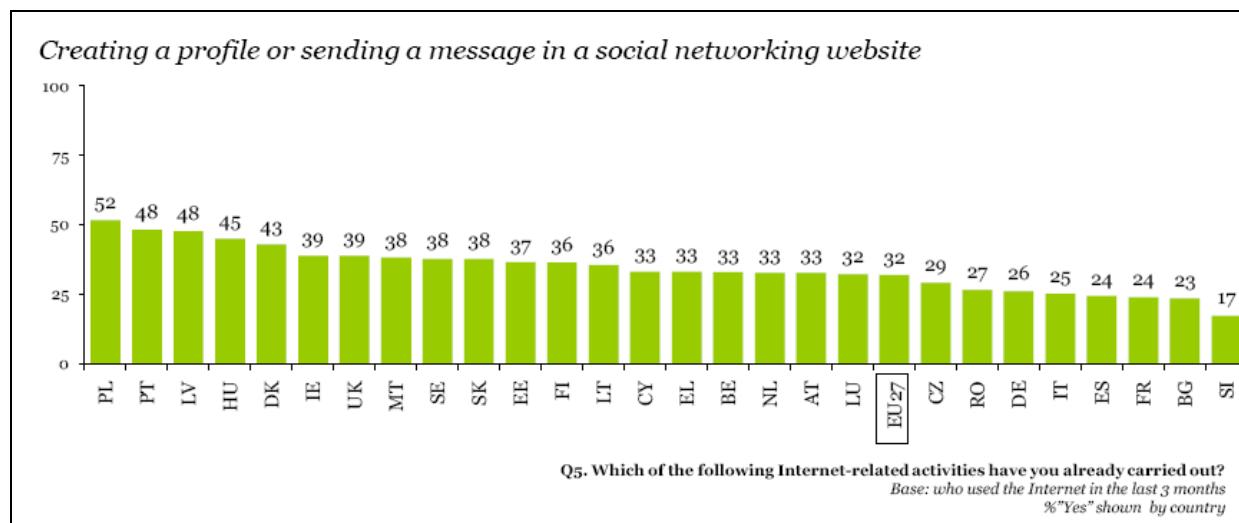
Figure 1: Individuals who uploaded self-created content to any website to be shared, in the last 3 months, 2008-2009



Source: Eurostat online database, data from Community survey on ICT Usage In Households and by Individuals

The uptake of online social networking in recent years has been very rapid, in spite of the fact that some services seem to have lost their appeal after users have passed an initial period of experimentation. The share of Internet users who have subscribed to a social networking platform by creating a profile has exploded in recent years (Fisch & Gscheidle, 2008). Data from the 2008 Eurobarometer on "Information society as seen by EU citizens" (see Figure 2) indicate that across the EU27, about one in three of those who are online are active users of social networking sites.

Figure 2: Share of Internet users who have created a profile or send a message in a social networking website



Source: The Gallup Organization (2008, p. 24)

While the number of active users, i.e. those who use social networking services frequently and regularly contribute content, is certainly smaller (Lindmark, 2009), these numbers still suggest that Web 2.0 applications are perceived of providing significant value to a large share of Europeans.

To sum up, in spite some understandable wariness about the spread of yet another buzzword the advance of Web 2.0 might indeed be rightfully called a watershed in the way the Internet is being used, especially insofar as social uses are being discussed. In 1999 it was still possible for Ellen Seiter to announce that “as the Internet develops from a research-oriented tool of elites to a commercial mass medium, resemblances between Web sites and television will increase. [...] It seems increasingly likely that commercialisation of the Web will discourage activism in favour of consumerism and the duplication of familiar forms of popular mass media, such as magazines, newspapers, and television programs” (Seiter, 2003, p. 95). A decade later, hardly anybody would still claim that the Internet is developing into a one-way mass medium similar to television.

This implies that Web 2.0 services are of some relevance for an analysis of the Internet’s implications on sociability in Europe. Moreover, technological and economic trends in this area need to be followed closely in order to avoid that market developments create a situation which creates disadvantages or risks for users of, for example, privately operated social networking sites. We will return to this issue in the section on policy implications (chapter 5).

3.2 Mobile telephony and mobile data services

In a development which has many similarities with the spread of Internet access, the diffusion of **mobile telephony** in the last two decades has exceeded all expectations. Users have been quick in grasping the possibilities which it offers them to do things they value highly, but could not do before (Feldmann, 2005; MobileLife, 2006). Most importantly, users of mobile phones are independent from stationary connections, i.e. they can make phone calls and send text messages from practically anywhere. The implication is that people enjoy considerably enhanced control over the communication process. But this is far from the only major transformative effect which is ascribed to wireless communication systems (see section 4.3).

The arrival of third and fourth generation of mobile telephony and the rapid increase in the functional range of mobile phone-based devices (integrating features of personal information managers, cameras, digital music players etc.) will also open up new possibilities and further heighten the transformative potential of this kind of applications.

One example of advanced social online applications enabled by the convergence between mobile telephony and the Internet are **moblogs**, i.e. weblogs which allow people to capture ordinary things in immediate life and share them with friends and acquaintances (Koskinen, 2008). Moblogs and other applications which use transfer of visual representations could point the way to more widespread practice of “visual co-presence”, whereas services for continuous co-presence are predominantly text-based today (cf. Rheingold, 2002).

Moblogs are among a wide range of **mobile social computing** applications which have become available in recent years and months. For all of the Web 2.0 applications discussed in the previous chapter, mobile equivalents have been developed. However, due to the specific characteristics of personal communication technologies – they are always on, always on/near the body, provide greater context awareness regarding location, time and social context, but face constraints in terms of information quantity that can be transmitted – “mobile 2.0” applications need to be tailored to the demands and preferences of the mobile user (Pascu, 2008).

An especially important emerging type of mobile services are **location-based services** (LBS) supported by wide-area wireless networks. These services use information about a user's or other location to provide added value to customers using mobile telecommunications. They generally build on an automatic system to locate users or, more accurately, their equipment. Methods of automatically identifying user location include making use of intrinsic or added features of mobile phone networks, and satellite-based positioning systems. One of the earliest techniques for providing location information on users is based on the fact that the user of a mobile phone network whose handset is switched on is registered in the network as being located in the ‘cell’ served by the closest base station (network transceiver). This information can be used to identify the location of the caller. Examples of location-based services include personal navigation, emergency services (e.g. for elderly persons), tracking services and location-based advertising, which takes advantage of the knowledge about the user's position to enable the sending of advertisement messages referring to stores and other entities which are located in the vicinity of the user. Market development is still in the early stages, and many of the sizeable challenges related to data privacy as well as business model sustainability have not yet been tackled.

In sum, there can be no doubt that the rapid spread of new ICTs in the last two to three decades has greatly improved the ability of people to connect with each other and to exchange or retrieve any conceivable type of information. We need to be careful, however, lest we take for granted that “unfettered communication (a utopian attribute of the Internet) necessarily fosters healthy and socially beneficial communities” (Katz & Rice, 2002, p. 110). Just enabling people from different backgrounds (e.g. different nations, cultures) to communicate freely with each other will not necessarily yield positive outcomes. Careful research, properly guided by theoretical insight, is necessary in order to establish the social impacts following from the widespread take-up of the applications discussed in this chapter.

4 Social Impact Analysis

In this chapter we will apply the common framework developed for the study (see Deliverable 2) to the domain of sociability in community and family. Four main themes are distinguished which appear useful for analysing ICTs' social impacts, namely rationalization; networking and social capital; empowerment and participation; and information & lifelong learning.

4.1 Rationalization: The easing of social interaction

By rationalization we mean the ways in which ICTs act as tools which allow people to achieve relatively static goals and to perform well-established activities in slightly new, and more efficient ways (cf. Brynin & Kraut, 2006). The main effects here are of cost and convenience, and they typically involve a relationship of substitution.

A wealth of research, much of it from Europe, has provided clear evidence that ICTs:

- make involvement in the community easier, by offering effective tools for communicating within loose networks of contacts and by participating in a wide range of decision-making processes (Katz & Rice, 2002; Robinson & Alvarez, 2005);
- enable families to cope with the increasing demands arising from the typical conflicts between, on the one hand, individual autonomy and flexibility, and on the other hand, the continuous need for coordination, monitoring, support and backup systems to hold the family together.

While (until now) the Internet has arguably been of stronger importance for the former area, the mobile phone has clearly be more important for coordination within the modern "postpatriarchal" family.

ICTs, social participation and community involvement

Traditional social networks increasingly evolve into ICT-supported social networks, which Jan van Dijk (2006) calls "community online" (as opposed to the purely ICT-based "online communities").

Katz & Rice (2002) agree that available evidence suggests that the Internet makes it easier and more effective to engage in all traditional forms of social capital building, including maintenance of weak as well as strong relationships to other people. ICT appears to be of special value for maintaining those ties which are in some ways inhibited by physical distance: "The Internet is effective in maintaining weak ties, which otherwise would be lost in the trade-off between the effort to engage in physical interaction (including telephone interaction) and the value of the communication" (Castells, 2001).

A survey of European Internet users conducted by the TRANSFORM (2008) project¹¹, assessed group membership as an indicator for civil participation and individual-level investment in social capital. The survey included a question about the ways in which respondents communicate with other people in the group(s) they are member of. According to the results, 65% have been members of any type of group (business or professional association; a sport club or league; a religious organization; a hobby group or club; a neighbourhood, school, charity, voluntary or any other local group; a political or activist group; or any other group or organization) in the three years prior to the survey. The question

¹¹ See footnote 12.

asks whether respondents have *actively* taken part in decision-making and discussion within any group they are member of, in order to distinguish between active and passive group member only.

The data allows to analyse the correlation between active participation in groups with the use of ICTs for making contacts within groups. It has been argued that extensive use of ICTs is detrimental for civil participation, as face-to-face contacts are replaced by media-poor ICT-mediated contacts, such as via e-mail, chat or instant messaging. The results presented in Table 1, however, show that strong use of e-mails and other ICT for making contacts within groups goes hand-in-hand with a stronger participation in day-to-day decision-making within these groups. It would, of course, be misguided to suggest a direct causal relationship; instead, the data reflect the fact that strong participation in decision-making increases the utility of e-mail & co. for communication, while frequent use of ICTs makes it more likely that people participate in day-to-day decisions within groups.

**Table 1: Relationship between active group membership and ICT use
(% of those with group membership)**

	Use of e-mail, etc for contacting group members				<i>Total sample</i>
	Never	Several times per year to once a month	About once a fortnight to once a week	At least 2-3 times a week	
Passive group membership only	74.6	36.3	22.8	15.2	37.6
Active group membership (participation in decision making) several times per year to once a month	14.6	44.9	27.5	13.0	21.3
Active group membership (participation in decision making) about once a fortnight to once a week	7.7	13.5	35.9	28.1	21.5
Active group membership (participation in decision making) at least 2-3 times a week	3.1	5.2	13.8	43.7	19.6
<i>Total</i>	100	100	100	100	100

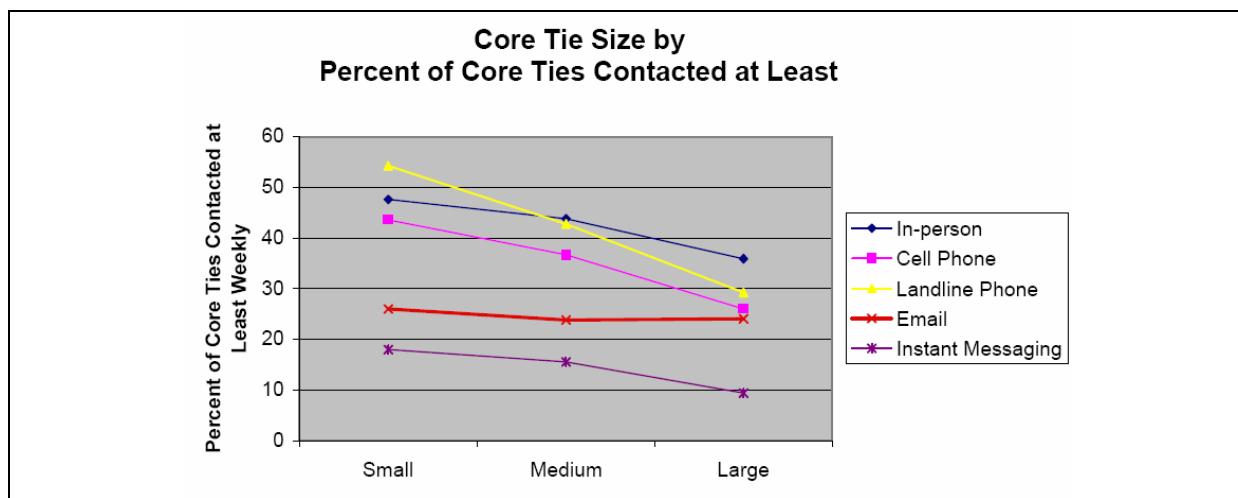
Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

A 2006 Pew Internet survey on "the strength of Internet ties" (Boase et al., 2006) provided some interesting findings with respect to the role of e-mail and the Internet for social networks. The researchers found evidence that:

- "Email is more capable than in-person or phone communication of facilitating regular contact with large networks"
- "Email is a tool of 'glocalization'. It connects distant friends and relatives, yet it also connects those who live nearby."
- "Email does not seduce people away from in-person and phone contact."

Support for the first statement was found when analysing the effect which changes in the size of networks of social ties have on the frequency of contacting these ties at least once a week. Figure 3 shows that as "there are only 24 hours in a day, and so it is not surprising that the amounts of time people spend on in-person and phone contact with their [social] ties, on a percent basis, decreases when they have large networks" (Boase et al., 2006, p. 15).

Figure 3: Relationship between size of network of social ties and frequency of contact (Pew findings)



Source: Boase et al. (2006, p. 16)

However, "it is a different story for email: People contact the same percentage of [social] ties at least once per week regardless of whether their networks are large, medium, or small. This means that a greater number of social ties are contacted by email in large networks. For example, two people contact 50% of their network ties, but Person A contacts only 5 people in his small network of 10 people whereas Person B contacts 15 people in her large network of 30 people" (*ibid.*). This finding is of some relevance as it suggests that e-mail is of high instrumental value for maintenance of weak ties, since they are typically much more numerous compared to strong ties and as such more difficult to maintain by means of face-to-face or telephone communication. It appears that, in particular, the one-to-many functionality of e-mail and other ICTs (instant messaging, texting) enables maintenance of larger networks of social ties.

Can we find such evidence in Europe as well? In order to test this hypothesis, the 2008 TRANSFORM survey included an extensive module on social ties, their structure and diversity and the means with which these are being contacted (cf. Gareis et al., 2008). TRANSFORM conducted a representative survey among regular Internet users in 12 EU regions¹².

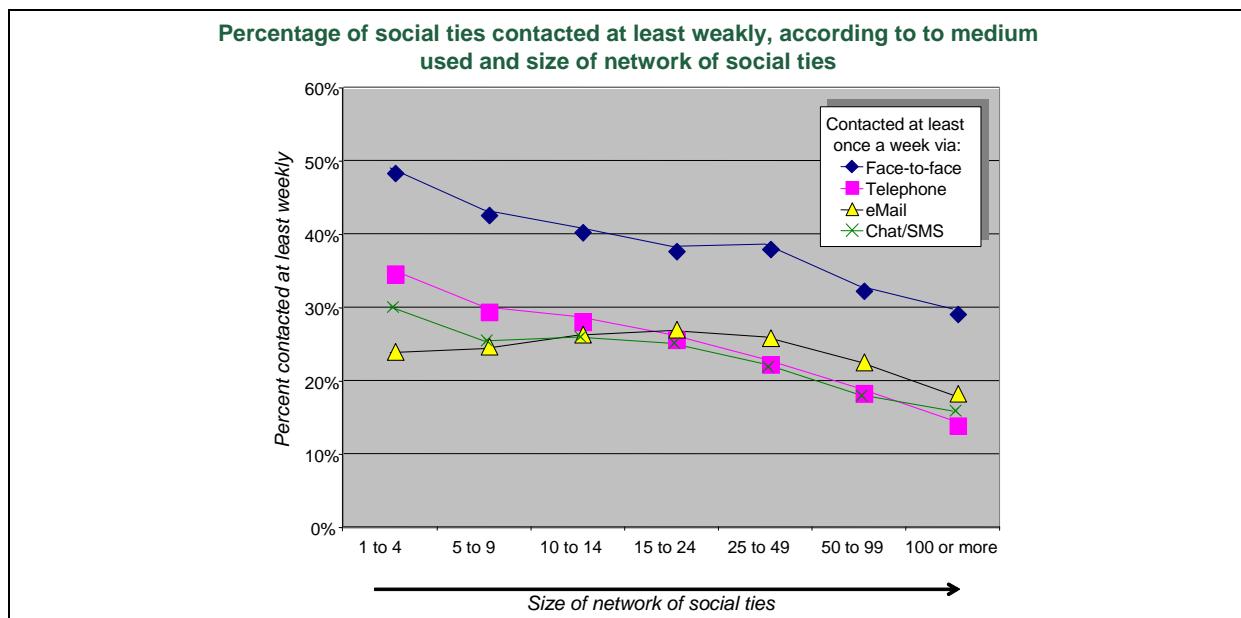
Results which directly relate to the Pew Internet-derived results from Figure 3 are presented in Figure 4¹³. For grouping different sizes of the personal network of social ties, a finder grading was used in order to add precision to the analysis.

¹² The TRANSFORM regional population survey was conducted in late 2007/early 2008. Data collection was designed as an Internet user survey with the universe set as the total online population aged 18-64 in twelve EU NUTS 2 regions: Poland: (a) Pomorskie, (b) Malopolskie; Slovakia: (a) Bratislavsky Kraj, (b) Vychodne Slovensko; Germany: (a) Schleswig-Holstein, (b) Thüringen; Sweden: Mellersta Norrland; Italy: Emilia-Romagna; Spain: (a) Navarra, (b) Extremadura; UK: (a) South Yorkshire, (b) East Anglia. Sample size: At least 300 successful interviews per region, except Slovakia: 200 interviews per region. Total sample size: 3588

¹³ Note that while the Pew Internet study differentiated between "core ties" and "significant ties" (which appears to have been an – not fully successful – attempt to separate "strong ties" from "weak ties" as discussed in the social capital literature). Rather than to replicate this approach, the TRANSFORM survey only asked for one type of social ties, operationalised as follows: "We would like to ask you about those people in your life you feel close to, but are not part of your immediate family. With immediate family we mean = parents, grand parents, siblings, children, grand children and in-laws. By "feeling close" we mean people who are not just casual acquaintances but people you discuss important matters with, you keep in touch with, and who are there for you when you need help." Weak ties as defined in the literature are dealt with in a separate question which asks

In line with the findings from Pew Internet, we can observe that the share of social ties which are contacted at least once per week per phone or face-to-face is decreasing significantly with increasing network size. The same is true, to a somewhat lesser extent, for contacts via text messaging. Again as in the Pew Internet study, the pattern for contacts via e-mail or instant messaging is markedly different: For social networks up to a size of 50 persons, the curve is if anything rising rather than falling, and only sags for social networks of very large size (more than 50 persons). The latter suggests that there are limits to the possibility of keeping regular contact to large networks of social ties. Nevertheless, the fact that the share of people contacted at least weekly via e-mail appears more or less independent from the size of the network up to a size of around 50 people indicates that e-mail is indeed a powerful means to maintain individual social capital.

Figure 4: Relationship between size of network of social ties and frequency of contact (TRANSFORM)

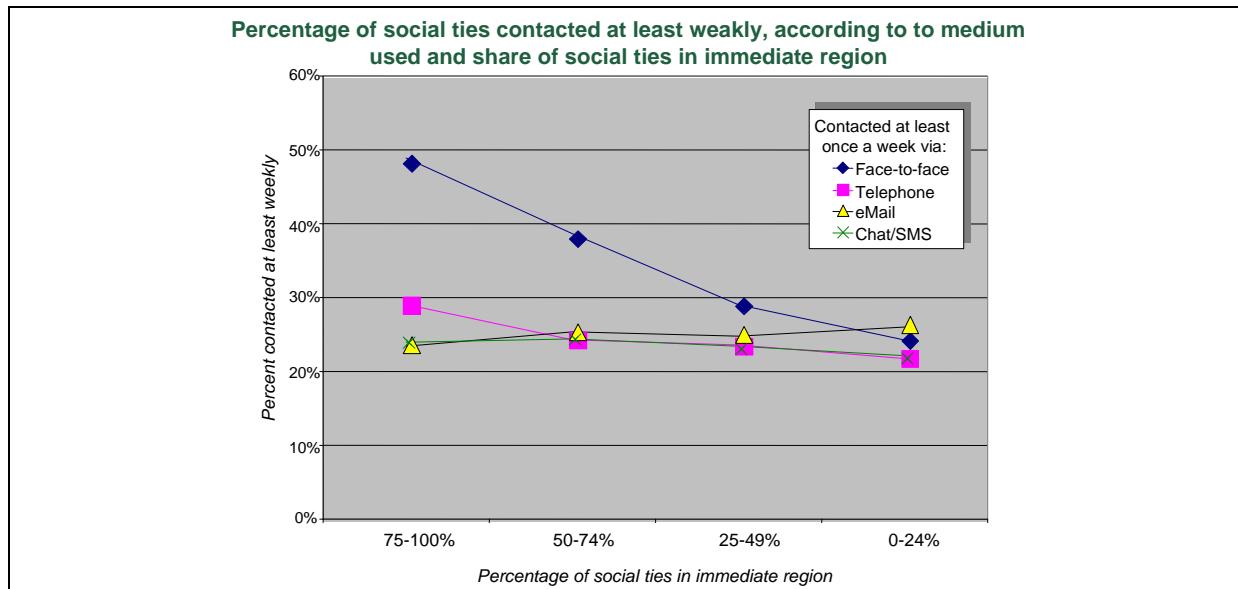


Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

The same patterns can be observed when we look at the relationship between the geographical spread of social network of ties and the share of these ties which are contacted at least once a week (see Figure 5). While the share of social ties contacted at least weekly drops considerably the more of these are located outside of the immediate region (typically: NUTS 3 region), the negative correlation is much less pronounced for contacts by telephone and by text messaging, and does not show at all for contacts via e-mail. The capability of e-mail to enable social ties which spread across distance is well reflected in these data.

whether the Internet has had an affect on the number of “people you communicate with at least occasionally for private purposes” and “as part of your job”, respectively.

Figure 5: Relationship between geographical spread of network of social ties and frequency of contact (TRANSFORM)



Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

A research study undertaken by Utz (2007) in the Netherlands, primarily involving young adults, explored the use of e-mail and the telephone for long-distance friendships. Apart from measuring media use, the study also measured the intimacy of the respective contacts. Findings suggest that, for young people at least, "the closer the friendship, the more emails were written in total, but the less the relative use of email. Instead, the percentage of phone calls increased". Moreover, "whereas the intimacy of the phone calls did not change with increased closeness of the friendship, the intimacy of the phone calls increased with increasing closeness of the friendship" (Utz, 2007, p. 694). This suggests that the phone is still the preferred choice for discussing intimate issues, i.e. issues of high personal importance.

ICTs and the "postpatriarchal" family

One way in which mobile phones together with other ICTs have impacted heavily on the modern family is by allowing people to negotiate time-space-pressures facing the modern family (Turkle, 2008).

The most important process through which this can be achieved is what Ling (2004) has called micro-coordination. He defines micro-coordination as "the nuanced management of social interactions. [It] can be seen in the redirection of trips that have already started, it can be seen in the iterative agreement as to where and when can meet friends, and it can be seen, for example, in the ability to call ahead when we are late to an appointment" (Ling, 2004, p. 70).

Castells et al. (2007, p. 90) speak of the "micro-coordinated family enabled by perpetual contact". Campbell (2008, p. 159-160) emphasises that perpetual contact does not imply constant communication, but rather ever-present "*possible communication*" that underlies all forms of mobile phone use and reasons for adoption. [...] The phrase [...] refers to the ability to connect and not the connection itself".

As Campbell (2008, p. 159-160) states, however, it is not 'pure communication' but rather "*possible communication*" that underlies all forms of mobile phone use and reasons for adoption. [...] The phrase [...] refers to the ability to connect and not the connection itself".

With regard to gender differences, Kennedy & Wellman (2007, p. 664) found in their research that "women tend to use the Internet [and mobile phones] to reinforce existing personal relationships with family and friends", which is consistent with most other research into gendered uses of ICTs (...). This findings is tentatively confirmed by other research from Europe.

4.2 Networking and Social Capital

The interrelation between use of the Internet and social interaction has been researched comprehensively in recent years (see Robinson & Alvarez, 2005 and van Dijk, 2006 for an overview). Castells (2001, p. 128) describes the evolving patterns of sociability, enabled by the Internet, mobile telephony and other ICTs, as "networked individualism". In fact, the community as a social construct – based primarily on face-to-face interaction and as such bound to a limited geographical territory, such as a neighbourhood – has lost much of its relevance long before the advent of ICTs and the Internet (Wellman, 2001). It still far from clear, however, what influence the increasing practice of networked individualism, heavily based on ICTs, has on society.

In their influential book from 2002, Katz and Rice summarise the findings from research up to the early years of this decade as follows:

- The Internet makes it easier not only to participate in all the traditional forms of social capital, but also contributes to overall levels of social capital. This is done often by people acting in self-interest, which as a result of network effects creates both individual-level and collective-level social capital – intentionally or not. "The Internet provides more opportunities to activate resources and create new knowledge for oneself and others" (Katz & Rice, p. 334). Internet users were found to be significantly more likely to have a sense of belonging to a social group than non-users (after controlling for demographics).
- More surprisingly, the Internet also builds new forms of social capital, at least in so far as "computer-mediated communication is not included in definitions of the social-capital processes of community, interaction, or participation". For example, the researchers found that "those who tend to be introverted find their social contacts expanded via the information relative to their non-surfing counterparts.[...] This means that "being an Internet user is itself a source of online sociability".
- Moreover, the Internet offers immense potential for identifying and interacting with people who have common interests, as suggested for example by the proponents of the "virtual communities" idea . The current debate about what has been termed "Web 2.0" , which is being taken up enthusiastically by users , as well as likely future developments in mobile applications ; point towards an increasing range of possibilities for Internet-based social innovations to transform patterns of sociability.

These results were upheld after controlling for the degree of offline sociability and for a number of personal characteristics which can be expected to affect the dependent variable.

More recent research has shown that use of the Internet is assimilated into the wider range of tools used by individuals to support their social circles (Cordell & Romanow, 2005)

Some researchers have claimed that the Internet helps build new forms of social capital "that are in many ways different and more powerful than the local, physical means of earlier areas"(Katz & Rice, 2002). This mainly refers to the new types of sociability enabled by the Internet as well as by mobile ICTs. Among these new forms, there is also what some scholars call sociotechnical capital: "productive resources that inhere in patterns of [impersonal] social relations that are maintained with the support of ICTs" (Resnick, 2005). This comprises automatic taste matching, recommender and reputation systems which are

being applied not only for commercial purposes (cf. eBay, Amazon), but also for helping users identify relevant news and form their opinion.¹⁴

The original perception of the Internet being detrimental to social capital may have been the result of a lack of contextualisation: "Any analysis of the relationship between new media or technologies such as the Internet and changes in the nature of and involvement in communities is naturally confounded with the changing conceptualization and reality of community itself" (Katz & Rice, 2002, p. 117). Indeed, Castells (2001) reminds us that the Internet, and the community-building which takes place in cyberspace, need to be interpreted as exacerbating a well-established trend in western industrialised countries, i.e. "a historical process of separation between locality and sociability in the formation of communities: new, selective patterns of social relations substitute for spatially bound forms of human interaction" (*ibid.*, p. 116). The change in the types of social capital which are sought, certainly enabled by the Internet and other ICTs, has its root in a growing diversity of sociability patterns which are themselves not caused (primarily) by any technologies.

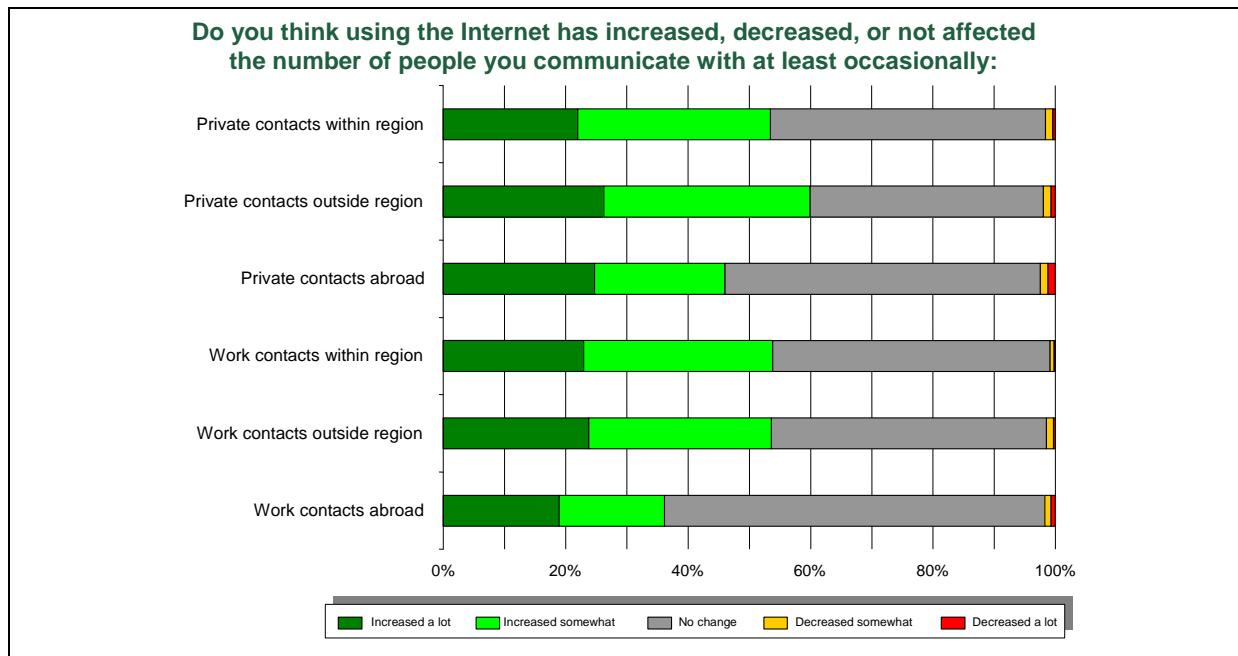
Recent research from Europe appears to confirm the main findings from Katz & Rice 2002 publication.

The TRANSFORM survey asked respondents directly whether they think that the Internet has had an effect on the number of people they communicate with at least occasionally. This is a very simple operationalisation of the notion of "weak ties" as suggested by Granovetter. Theoretical accounts of the relationship between ICT use and weak ties have repeatedly concluded that the Internet is likely to increase the number of weak ties as it diminishes the costs of keeping in (loose) contact with a large number of people. The TRANSFORM data reported in Figure 6 give confirmation to this proposition: More than one in two respondents state that the Internet has increased their number of private weak ties within the region as well as within the country.

This finding is consistent with the results from a number of other studies. A 2004 survey by Statistics Finland found that 70% of Internet users agreed "fully" or "to some extent" with the statement "With e-mail you contact people that you otherwise wouldn't" (Nurmela et al., 2006, p. 58). Other research by Statistics Finland (Nurmela, 2006) established significant correlations between ICT use and components of social capital, with the most significant being with community involvement (participation in voluntary or leisure activities). They also found significant correlations between use of ICT (especially number of phone calls and SMS messages) and several components of social capital (e.g. size of the social network, community involvement) (cf. OECD, 2008a, p. 23):

¹⁴

For a discussion of the Internet's impacts on social inclusion, see chapter 4.3.

Figure 6: The Internet's perceived impact on number of weak ties¹⁵

Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

Data from the World Internet Project, a series of harmonised population surveys on a large number of Internet-related topics, provides data on the perceived effect of respondents' Internet use on individual contacts depending on the type of contacts (WIP, 2009a, 2009b). As the following charts show (Figure 7 to Figure 10), the majority of Internet users in the countries surveyed report that the frequency of contact with other people has not changed.

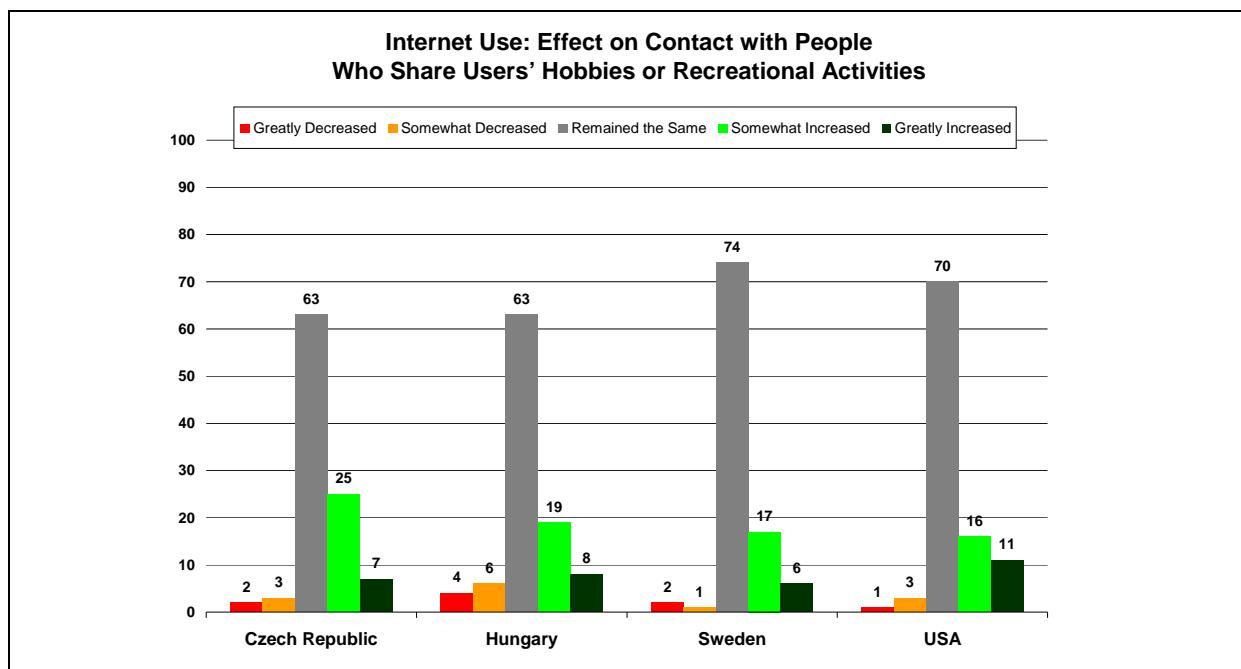
Still, a sizeable minority states that the Internet has had a positive effect on contacts with people who share the same hobbies or recreational activities (Figure 7) – from 23% in Sweden to 33% in the Czech Republic.

Results are similar with regard to contacts with people who share one's profession (Figure 10) but more inconclusive with regard to contacts who share one's political interests (Figure 8) and religious interests (Figure 9). At least in Hungary¹⁶ some Internet users have experienced that the frequency of contacts to these groups of people has decreased as a result of using the Internet. This raises the question whether, in particular, social exchange around religious beliefs will suffer from the spread of the Internet and online communication.

¹⁵ Lower three columns: People in employment or self-employed only.

¹⁶ And in some other non-European countries not depicted here, see WIP (forthcoming)

Figure 7: Perceived effect of Internet use on contact with people who share one's hobbies or recreational activities, 2007

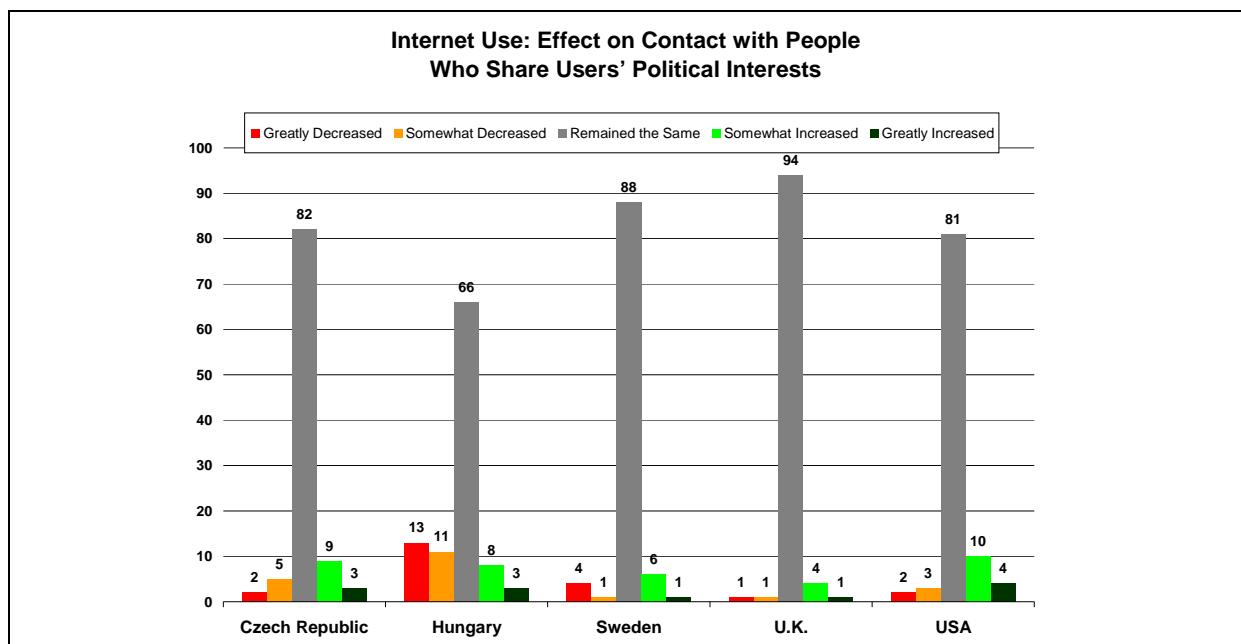


Source: The authors, based on WIP data, 2009

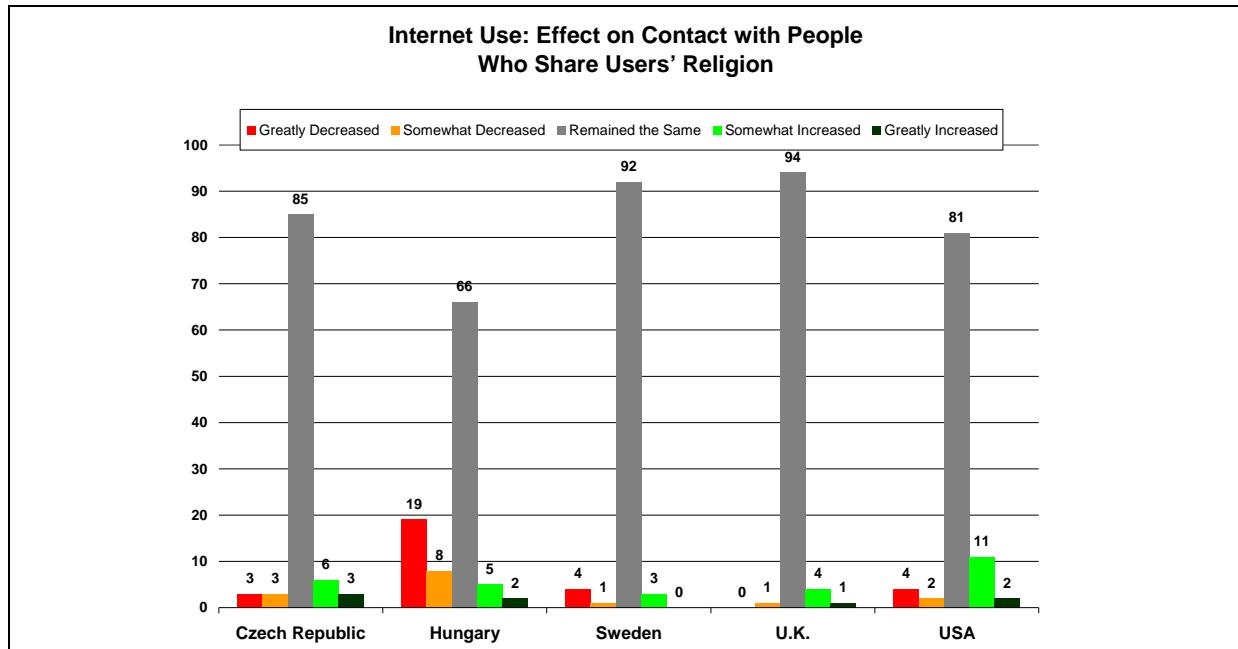
Other published research appears to come to similar conclusions. For example, collaborative content provides a new means for connecting with like-minded people (Ala-Mutka, 2008, p. 62).

In their analysis on use of ICT by immigrants and ethnic minorities, Diminescu et al. (2008) report that collaborative content can help connect people with similar ethnic backgrounds, for example through blogging.

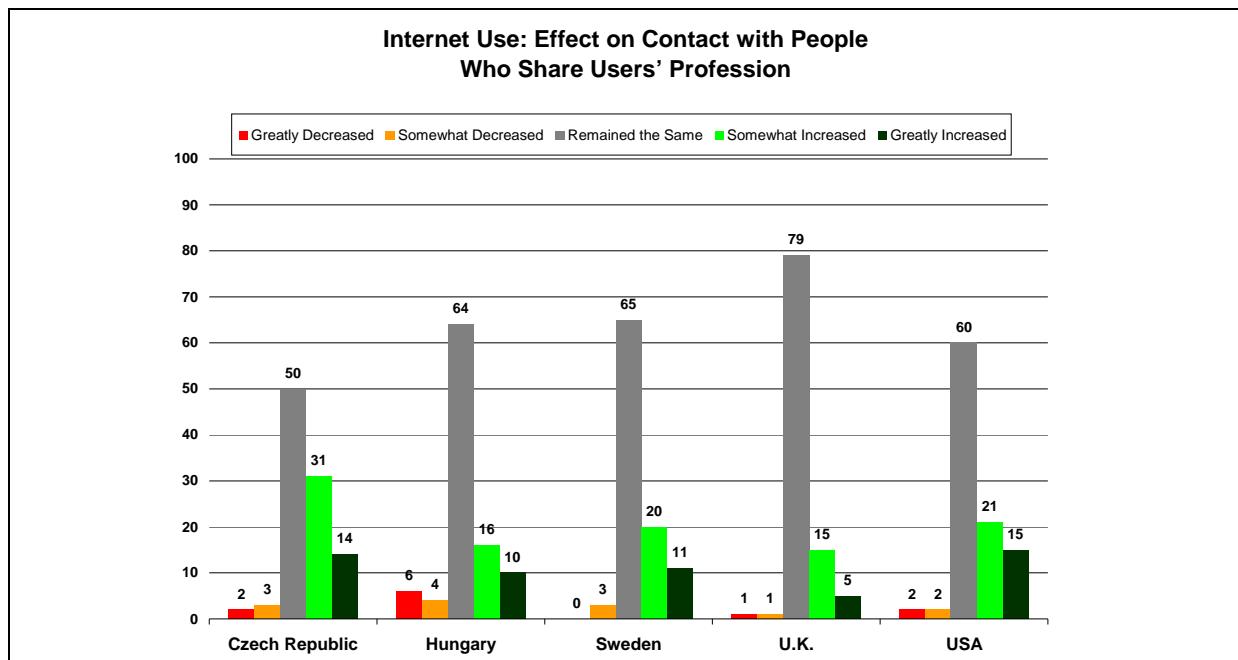
Figure 8: Perceived effect of Internet use on contact with people who share one's political interests, 2007



Source: The authors, based on WIP data, 2009

Figure 9: Perceived effect of Internet use on contact with people who share one's religion, 2007

Source: The authors, based on WIP data, 2009

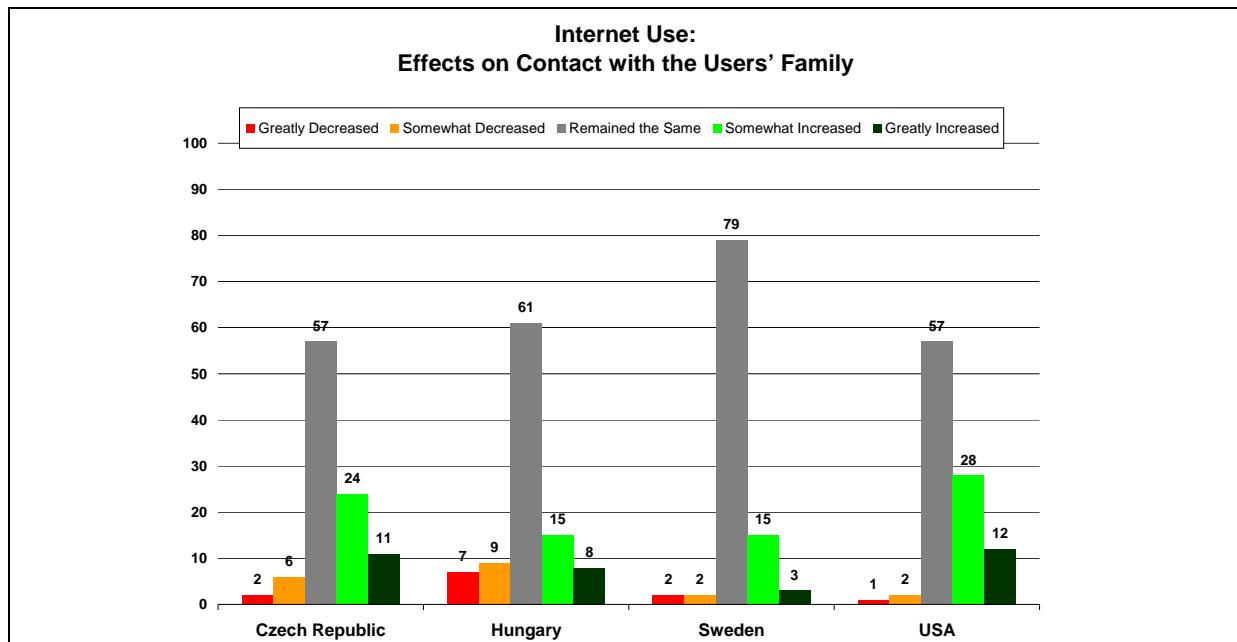
Figure 10: Perceived effect of Internet use on contact with people who share one's profession, 2007

Source: The authors, based on WIP data, 2009

The World Internet Project data (WIP 2009a, 2009b) also provides insight into user perceptions about the Internet's impact on their interaction with friends and family (Figure 11 to Figure 14). On average, most Internet users report there has not as yet been any tangible change to the frequency of contacts and to the time spent with friends and family. Those who state that there has been a change predominantly report that the number of contacts has increased rather than decreased: Between 18% (Sweden) and 40% (USA) experienced an

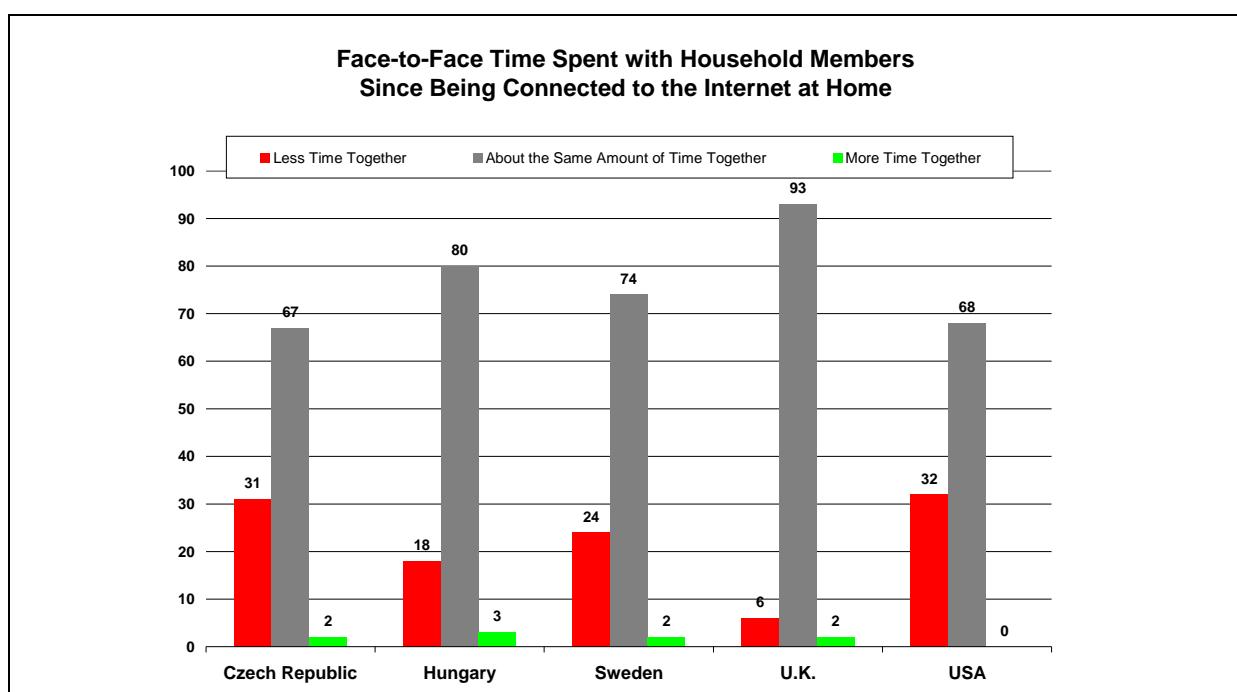
increase in contacts with their family, and between 26% (Sweden) and 53% (Czech Republic) say there has been an increase in contacts with friends. This implies that significant shares of the population in the countries covered by the survey have already experienced positive impacts of the Internet on their ability to stay in touch with friends and family.

Figure 11: Perceived effect of Internet use on contact with one's family, 2007

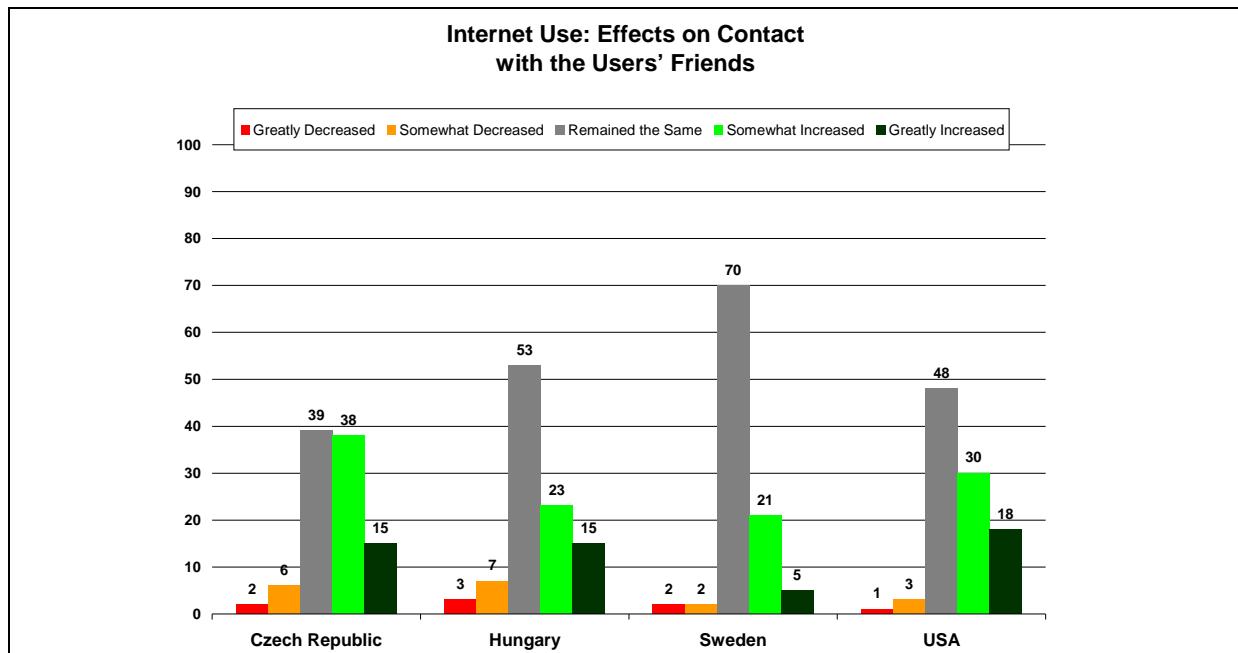


Source: The authors, based on WIP data, 2009

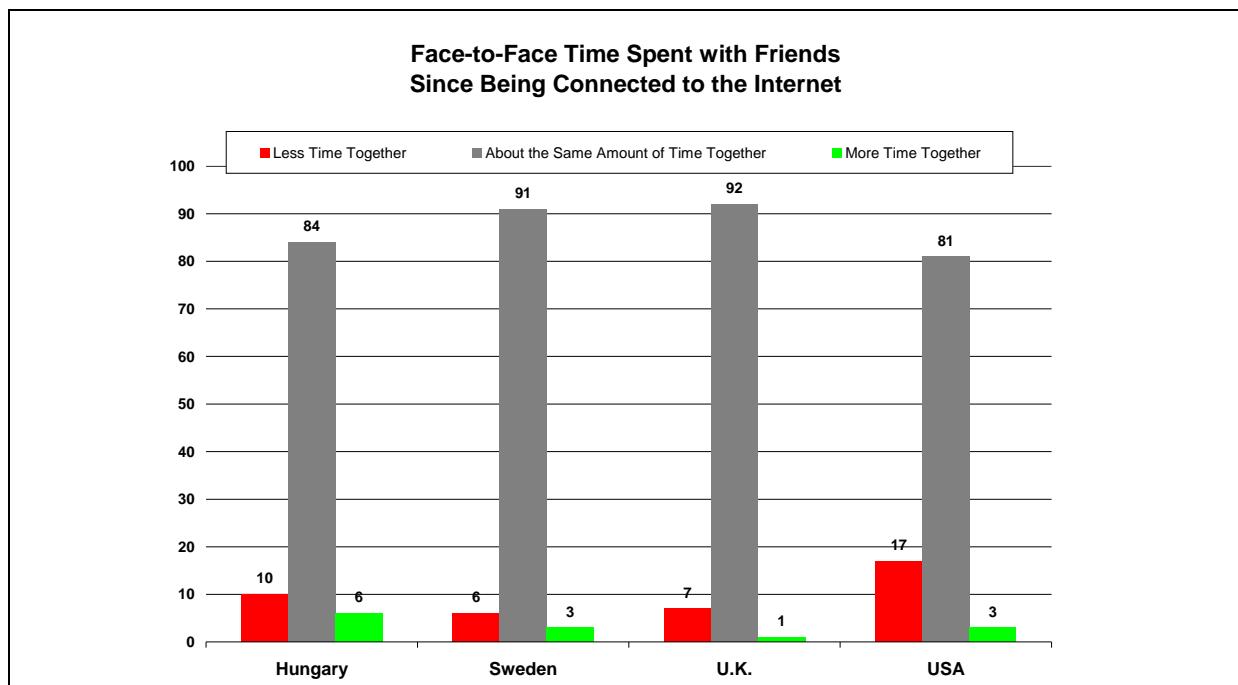
Figure 12: Perceived effect of Internet use on face-to-face time spent with household members, 2007



Source: The authors, based on WIP data, 2009

Figure 13: Perceived effect of Internet use on contact with one's friends, 2007

Source: The authors, based on WIP data, 2009

Figure 14: Perceived effect of Internet use on face-to-face time spent with friends, 2007

Source: The authors, based on WIP data, 2009

On the other hand, however, a sizeable minority of Internet users reports that the time spent engaged in face-to-face interaction with household members (Figure 12) and – to a lesser extent – with friends (Figure 14) has decreased as a result of them using the Internet. Between 6% in the U.K. and 32% in the USA say that they spend fewer hours with household members at home.

In sum, the WIP data suggest that the effect of the Internet on sociability is predominantly neutral to positive, with increasing contacts reported, in particular, for friends, people who share the same recreational activities and people who share the same professions. There are some indications that contacts of a religious nature might suffer from Internet use. Moreover, there is a tendency for less time being spent with household members.

More specifically, what emerges is a picture where interaction with remote friends and family members gets stronger at the expense of interaction, especially face-to-face contacts, with those people who are in the direct vicinity (such as the household). This would also imply a partial substitution of ICT-mediated communication for face-to-face interaction, albeit not necessarily with the same persons.

The Oxford Internet Survey includes questions on meeting people online (Dutton & Helsper, 2007, p. 57). In response to the question "Have you ever met new people on the Internet that you did not know before?", somewhat less than a quarter (23%) of Internet users in the U.K. report they have met an online friend they did not know before going on the Internet – an increase of 3 percentage points over the 2005 figure. Men were found to be more likely than women to meet new people online in the U.K., and students were found to be more than three times more likely to make online friends than retired Internet users.

The OxIS researchers also wanted to know whether contacts made over the Internet sometimes lead to meeting face-to-face, i.e. to what extent online friends can become friends in the "physical world" (Dutton & Helsper, 2007, p. 57). The related question was worded as follows: "Thinking back to all the people you have met on the Internet, have you gone on to meet any of them in person?" The survey found that about half (47%) of those who have met someone online have gone on to meet them in person. This translates into almost 12% of Internet users (half of 23%) who in 2007 have gone on to meet someone offline whom they have met online in the first place (cf. di Gennaro & Dutton, 2007).

In order to gain insight into the factors which can explain differences in social capital at the individual level, Gareis et al. (2008) ran a multivariate OLS Regression using the TRANSFORM survey data described above.

As dependent variable, they used a synthetic compound indicator on "individual social capital". Operationalisation of social capital for the purpose was informed by the UK statistical framework for the measurement of social capital (Harper & Kelly, 2003). The index must be considered as a rough proxy for social capital rather than a comprehensive measurement of all aspects which may be relevant for the issue. The index was constructed from the following variables:

- For social participation, we chose "active group membership" as indicator;
- For the size of social networks, we chose the number of personal social ties;
- For the diversity of social ties, we chose the number of social ties from a list of different occupations, ethnic groups and non-native languages;
- For reciprocity and trust, we chose the mean of three trust variables: general trust in people ("Generally speaking, most people can be trusted"); trust in people in the neighbourhood ("Most people in my neighbourhood can be trusted"); and trust in helpfulness ("People around here are really willing to help each other out").

Each of the four variables were translated into a 5-point scale, normalised variable with 1 = weak/low and 5 = strong/high. The index was calculated as the sum of these values.

As independent variables, three groups of variables were considered: Socio-demographic variables (age, gender, region, still studying yes/no, educational attainment, employment status and household type); Internet experience variables (year started using Internet, hours Internet use per day, multi-location Internet use, providing help about computers to others);

Type of Internet usage (Importance of different uses of the Internet for private life, uptake of participative web services). The results are presented in Table 2.

Table 2: Association between social capital, ICT-related and contextual factors (OLS Regression of survey data from TRANSFORM project)

	Unstandardized B	Std. Error	Standardized Beta	t	Sig.
(Constant)	-19.27	9.89		-1.95	0.05
Age	0.01	0.00	0.11	4.73	0.00
Gender: female	-0.10	0.03	-0.06	-3.12	0.00
<i>Region: reference=Thüringen</i>					
Schleswig Holstein	-0.02	0.07	-0.01	-0.23	0.82
Emilia Romagna	-0.20	0.07	-0.06	-2.67	0.01
Malopolskie	0.33	0.07	0.11	4.51	0.00
Pomorskie	0.32	0.07	0.11	4.33	0.00
Bratislavsky Kraj	0.07	0.09	0.02	0.77	0.44
Vychodne Slovensko	0.08	0.08	0.02	0.93	0.35
Navarra	0.44	0.07	0.14	5.93	0.00
Extremadura	0.29	0.07	0.10	4.05	0.00
Mellersta Norrland	0.16	0.08	0.05	2.07	0.04
South Yorkshire	-0.33	0.07	-0.11	-4.51	0.00
East Anglia	-0.29	0.07	-0.09	-3.90	0.00
Still studying	0.16	0.06	0.08	2.72	0.01
<i>Education: reference=lower secondary and less</i>					
Upper secondary education	0.05	0.05	0.03	1.01	0.31
Tertiary / other 21+ education	0.10	0.06	0.06	1.89	0.06
<i>Employment status: reference=inactive</i>					
Employee (incl. family workers)	-0.03	0.07	-0.02	-0.47	0.64
Self-employed	0.04	0.08	0.01	0.44	0.66
Unemployed	-0.18	0.08	-0.05	-2.17	0.03
Student (not in the labour force)	-0.21	0.09	-0.09	-2.25	0.02
<i>Household type: reference=single household</i>					
2+ person household, no kids <16	0.15	0.05	0.09	2.86	0.00
Household with children <16	0.14	0.05	0.08	2.63	0.01
Year started using Internet (4-digit)	0.01	0.00	0.04	2.17	0.03
Duration Internet use per day in minutes	0.00	0.00	0.00	0.07	0.94
Frequent multi-location Internet use (y/n)	0.15	0.04	0.08	4.10	0.00
Providing help to others than friends/family (y/n)	0.27	0.04	0.15	7.47	0.00
Internet use type: health/local/career (factor score)	0.07	0.02	0.08	4.42	0.00
Internet use type: communication/work/studies (factor s.)	0.06	0.02	0.07	3.56	0.00
Internet use type: commercial Internet use (factor score)	0.02	0.02	0.02	0.95	0.34
Index: number of web 2.0 uses	0.11	0.01	0.18	9.18	0.00

Dependent Variable: Social capital compound index (5-point scale)

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	468.4	30	15.6	27.7	0.000
Residual	1343.5	2388	0.6		
Total	1811.9	2418			
Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate	
	0.508	0.259	0.249	0.750	

Source: Gareis et al. (2008)

Controlling for contextual factors such as socio-demographics, Gareis et al. (2008) find a significant, positive influence of: multi-location Internet use (as opposed to single-location use); giving help in using computers to others apart from family & friends; strong perceived importance of “communication, work & studies” and “general information search” (rather than commercial) uses of the Internet; and – in particular – uptake of participative Internet services (typically referred to as Web 2.0 applications), here defined as comprising: Posting messages to newsgroups etc.; Creating or maintaining own weblog; Uploading self-created

text, images, photos, videos, music etc. to any website to be shared; Creating a profile on a social networking site; and designing or maintained a website.

Of the socio-demographic variables, the results indicate that the following groups are significantly more likely to have strong social capital: individuals in multi-person households as opposed to people living in single-person households; students; older Internet users; men; Internet users in the Polish and Spanish regions in the sample, when compared to the other regions (in particular the English regions and Emilia-Romagna).

The authors summarise the findings from the TRANSFORM research as follows:

- The way the Internet is used is indeed strongly associated with levels of social capital, when the latter is defined in simplified terms as being made up by the level of trust, the number and diversity of social ties, and active membership in social groups. While the intensity of using the Internet, measured in average hours per day, does not exert a significant influence, the fact that the Internet is used at more than one location (arguably, the first step towards "always & everywhere on" access) as well as the relevance which is given to non-commercial uses of the Internet were both found as significant explanatory factor. This is consistent with findings from previous research according to which "patterns of Internet use, such as using the Internet for communication versus entertainment, provide the most critical basis for explaining the development of online friendships as well as their transitioning to offline settings" (di Gennaro & Dutton, 2008, p. 596-7).
- In particular, the extent to which Internet users have taken up participative Web2.0 services such as social networking, blogging and contributing self-created content is strongly associated with levels of social capital. In general, it appears that the more advanced the use of the Internet, the higher is the score on the social capital index. Care should be taken, however, not to conclude that there is a direct causal link between ICT use and social capital. Rather, this is a case of mutual reinforcement: On the one hand, the more people are engaged within social networks and the more they put trust in fellow citizens, the higher is the utility which they can derive from using advanced Internet applications; on the other hand, the more experience people have gained in using such Internet applications, the easier it is for them to actively engage in social networks. These findings give support to the emerging view that the Internet is enabling persons with strong individual social capital to more effectively reproduce it (Warschauer, 2003). On the other hand, since age, gender, employment status, household type and educational attainment are controlled for, the results indicate that "the role of the Internet in social relationships [is] something more than that it is merely integrated into the maintenance of offline relationships" (Jensen et al., 2007).
- A strong association is also found between helping people other than friends and family in using computers and the Internet on the one hand and the social capital compound index on the other. This appears partly self-evident as more and stronger social contacts also provide more opportunities for helping others use computers. It is also, however, a reminder of the role which strong social capital plays for enabling the transfer of skills within a region. This is of special relevance for the case of digital literacy skills, since other data from the same survey (TRANSFORM, 2008) suggests that informal help from others – in combination with learning by doing – is perceived as by far the most important sources of computer skills.
- In sum, the TRANSFORM data analysis suggests that the Internet has indeed a tangible "impact" on users by allowing them to maintain close contact to large networks of social ties, by enabling participation in Internet-based forms of creativity and socialising, by allowing frequent participation in decision-making within social groups, and by supporting the maintenance of social capital.

Norway-based Richard Ling, in his latest published research (Ling, 2008), explored the impact which mobile communication has on ritual interaction, which he claims – drawing back on the work of Emile Durkheim, Erving Goffman, and Randall Collins – is the basis for the development and maintenance of social cohesion and solidarity at the microsocial level.

Rituals enhanced by mobile phone use include:

- Pre-configured greetings (the “virtual tap on the shoulder”, when communication partners declare each other their “ambient accessibility” [cf. Ling, 2008, p. 119-121]). Ito and Okabe (2005, p. 264) describe such messages as defining “a space of peripheral background awareness that is a midway between direct interaction and noninteraction”.
- Use of illustrative photos/videos in normal conversations, which is a more efficient way of doing the same which has frequently been done since private households became access to photographic depictions of their lives (Ling, 2008, p. 99).
- Negotiation of romantic involvements: “this steady stream of text exchange, punctuated by voice calls and face-to-face meetings, defines a kind of ‘tele-nesting’ practice that young people engage in, where the personal medium of the mobile phone becomes the glue for cementing a space of shared intimacy” (Ito, 2004). The same author also speaks of “augmented flesh meetings” (Ito & Okabe, 2005).
- Group definition and boundary-maintenance function of mobile communication (Ling, 2008). Includes the definition of power relationships, which are a key component of group membership.
- Repartee, humour and group solidarity: “In league with co-present interaction and co-present humor, mediated humor provides for social integration and in-group solidarity. Humor is a way to assert power without the need for coercion, and it allows for various types of social repair work. Finally, humor is a way for a group to mark boundaries” (Ling, 2008, p. 137). The use of humour is very widespread for underscoring in-group/out-group differences, i.e. marking the boundaries between ‘us and them’.
- Gossip, which allows groups to work out shared value sets. It is also used to regulate status ambitions within the group. “Internal gossip is the sign of a well-functioning small group. Gossip tells us that there is trust between group members, that the power relations have reached some equilibrium, and that there is the ability to define a common ideology or ethic.[...] The mobile phone is a perfect device for tucking gossip sessions into the folds of everyday life” (Ling, 2008, p. 152; cf. Eder, 1988).

Ling (2008, p. 155) concludes that “the mobile phone has extended the range of the group interaction”, and it is “extending the original bond beyond co-present situations into the folds of daily life” (*ibid.*, p. 157). Mobile communication not only provides a new channel for group members through which to interact, a channel which is marked by a very low threshold for interaction; but it also opens up the “possibility for uniquely mediated forms of ritual”. In sum, mobile communication “seems to result in stronger internal group bonds” (*ibid.*).

Mobile texting appears to be, in particular, limited to communication with friends and peers, i.e. existing relationships. Reid & Reid (2004) found a preference for texting corresponding to a preference for smaller tighter social groups. This is supported by evidence from Japan, where “mobile mail [texting] appears to support only a closed network, whereas PC e-mail was found to promote friendship with distant friends” (Ishii, 2006). Habuchi (2005, p. 167), in this context, talks of a “tele-cocoon”, a “zone of intimacy in which people can continually maintain their relationships with others who they already encountered without being restricted by geography and time”.

While people tend to have a strong preference for face-to-face interaction with friends in comparison to communicating with the same people in a mediated way (Ling, 2008, p. 118), the same is not true of course if the people with which one can have face-to-face interaction are strangers, while the alternative option is communicating with friends via the mobile. For

this reason “the mobile phone sometimes trumps co-present ritual”, which might be “hampering the ability to generate a common sense of the mood in these co-located settings” (Ling, 2008, p. 115). This accounts for the widely shared irritation with people who make use of their mobile phone in ways which takes little account of those around them (Katz, 2006). “When, for example, one is given the choice between conversing with another marginally known person at a bus stop and sending a text message to a paramour, there is little doubt as to the outcome” (Ling, 2008, p. 176).

A main difference between being immersed in mobile communication – and thereby often ‘lost’ for meaningful communication with those in direct proximity – and being immersed in listening to a walkman/MP3 player or in playing with a Gameboy, is that the former “is not abstract or ego-centered absorption in another thought world; it is social intercourse. It is a conduit through which we maintain social interaction, and we have to pay it heed” (Ling, 2008, p. 113).

4.3 Empowerment and participation

4.3.1 Empowering the individual

As the discussion in the previous section has shown, the issue of empowerment is in many ways directly related to ICT-induced changes in the structure of social relationships and social networks. The notion of “networked individualism” refers directly to the increasing degrees of freedom which ICTs give people with respect to making choices about the structure of their social networks and the type of their social relationships.

Among the ICTs which have become widely diffused in recent years, individual empowerment has been most often discussed in relation to the mobile phone, and mobile applications in more general.

Castells and colleagues (2004, 2007) identified a number of essential impacts of mobile phone use on patterns of social interaction:

- Autonomy and “mobile intimacy”: This means the extension of personal links through a “technology closely associated with the body” (MobileLife, 2006, p. 45) rather than with the physical location of the household or the workplace. Users of mobile telephony significantly enhance their autonomy – “vis-à-vis spatial location, time constraints, and to a large extent, social and cultural norms”.
- Networks of choice: Shifts in the ways people organise their life through the mobile phone and also in the types of networks which are being created and maintained: “Mobile communication has greatly enhanced the chances, opportunities, and reach of interpersonal sociability and shared practice”.
- Instant communities of practice: “The emergence of unplanned, largely spontaneous communities of practice in instant time, by transforming an initiative to do something together in a message that is responded from multiple sources by convergent wills to share the practice”. This practice, dubbed “smart mobs” by Rheingold (2002), has been observed in a number of cases from all around the world in which – within a very short time – a critical mass of political protesters was called to action by means of text messaging (cf. Benkler, 2006).
- Blurring of established boundaries: Mobile communication takes place in a spatial context and a new time which is chosen by the communicating subject (in interaction, of course, with the communication partner). Castells et al. interpret this as “an extraordinary strengthening of the culture of individualism (meaning, the primacy of individual projects and interests over the norms of society or reference groups) in material terms”.
- Users as producers of content and services: The ready availability of camera-phones which allow users to take photos and record short videos, together with the ability to

instantly share self-generated content with others over mobile networks, means that consumers are being empowered to become producers and distributors of content themselves. The possible social consequences of this are, however, far from uniquely beneficial, as the MobileLife report (2006, p. 45) points out when he warns that the general public may turn “into a mass of ‘little sisters’ reporting any activity deemed inappropriate”.

- Safety and surveillance: As survey data have repeatedly shown (e.g. MobileLife, 2006), the mobile phone makes people feel safer at the same time than it makes them enjoy greater autonomy. There are also threats, though: Because mobile networks register the geographical location of devices, this is a technology which makes near-ubiquitous surveillance possible, as a number of scholars including Rheingold (2002) have powerfully argued.
- Fashion, culture and language: Mobile phones are powerful purveyors of meaning. They are being adopted as part of the process of individual expression, of “the construction of identity by appropriating a new technological environment and still feeling oneself”. As such, the technology may also have transformed the use of language, for example in the form of texting-oriented vocabularies which are optimally tailored to the 160 character limit of SMS messages.

Licoppe (2004, p. 141) invented the term ‘connected presence’ for the type of communication between close friends, lovers or family members, and which is enabled by mobile telephony. He explains it as follows: Connected presence “consists of short, frequent calls, the content of which is sometimes secondary to the fact of calling. The continuous nature of this flow of irregular interaction helps to maintain the feeling of a permanent connection, an impression that the link can be activated at any time and that one can thus experience the other’s engagement in the relationship at any time”. Indeed, “[...] with mobile communication, we call to individuals, not to locations. [...] We have been witnessing a transition from geographically bound telecommunication to personal addressability via mobile communication” (Ling, 2008, p. 3-4).

In the same vein, Castells (2008, p. 448) reminds us that “mobile communication is not about mobility but about autonomy”, and goes on by emphasising that “we now have a wireless skin overlaid on the practices of our lives, so that we are in ourselves and in our networks at the same time. We never quit the networks, and the networks never quit us; this is the real coming of age of the network society. But these networks are self-centred networks”. The relationship of mobile telephony and empowerment becomes more than clear from his observations.

The topic of ICT-enabled empowerment brings up a number of issues with regard to social exclusion. Does the increasing spread of ICTs which are used for social interaction imply that people who do not have access, or people who make inadequate use of ICTs, are at risk of social exclusion? Indeed, the evidence compiled by Dutton (2005), van Dijk (2005) and Helsper (2008) suggests that differences in access to and use of the Internet exacerbates processes which are associated with social disparities.

Indeed, a recent study by Pew Internet & American Life Project (Boase et al., 2006) suggests that Internet users benefit from personal benefits as a result of the social contact-enabling characteristics of ICTs. The main results suggest that this is indeed the case, see Table 3.

Table 3: The Strength of Internet Ties: Summary of Findings from Pew Internet Study

- The Internet plays socially beneficial roles in a world moving towards “networked individualism.”
- E-mail allows people to get help from their social networks and the web lets them gather information and find support and information as they face important decisions.
- The Internet supports social networks.
- E-mail is more capable than in-person or phone communication of facilitating regular contact with large networks.
- E-mail is a tool of “glocalization”. It connects distant friends and relatives, yet it also connects those who live nearby.
- E-mail does not seduce people away from in-person and phone contact.
- People use the Internet to put their social networks into motion when they need help with important issues in their lives.
- The Internet’s role is important in explaining the greater likelihood of online users getting help as compared to non-users.
- Americans’ use of a range of information technologies smooths their paths to getting help.
- Those with many significant ties and access to people with a variety of different occupations are more likely to get help from their networks.
- Internet users have somewhat larger social networks than non-users. The median size of an American’s network of core and significant ties is 35. For Internet users, the median network size is 37; for non-users it is 30.
- About 60 million Americans say the Internet has played an important or crucial role in helping them deal with at least one major life decision in the past two years.
- The number of Americans relying on the Internet for major life decisions has increased by one-third since 2002.
- At major moments, some people say the Internet helps them connect with other people and experts who help them make choices. Others say that the web helps them get information and compare options as they face decisions.

Source: Boase et al. 2006.

4.3.2 Empowering families

Within families, ICT-enabled empowerment can have positive associations from an emancipatory viewpoint, as all family members can achieve a greater degree of control over their communication and information related behaviour. Katz (2003), who sees in modern society a gradual process of the “disintermediation of the parents”, declares that “the internet presents a [...] acute example of disintermediation in this double sense: giving the child the direct access to information that the parents cannot filter and giving the child expertise overshadowing that of his parents” (Katz, 2003, p. 50).

Empowerment of children is believed, however, to potentially endanger family cohesiveness and parents’ ability to “properly calibrate the permeable boundaries between the family and the world outside it – particularly when it comes to the protection and socialization of children” (Turow, 2003, p. 31). If it is true that “strong family relationships evolve through an awareness of boundaries between family members and the rest of the world” (*ibid.*, p. 27), then a weakening of family boundaries by means of mobile communication, the Internet etc. will put family relationships under stress. There is no way, however, to determine what the “right” strength of the boundaries between the private (family) sphere and the public sphere (rest of the world) is, because distinctions between public and private realms are socially constructed and negotiated, and they undergo changes over time (*ibid.*, p. 26).

The research of Kennedy & Wellman (2007, p. 663) in Canada has confirmed earlier insight according to which the Internet is not decreasing social interaction among household members, but rather that “adds to it and enhances it”: “ICT have paradoxically afforded household members the ability to go about on their separate ways while staying more connected. In such ways, rather than pulling households apart, ICTs have afforded mutual awareness, integration and support (665).

Turkle (2008, p. 127) speaks of the other-directedness which is fostered by ICTs, especially the mobile phone. Because ICTs offer the possibility for connected presence, instant communication and instant gratification of communication needs, "tethered children think different about their own responsibilities and capacities.[...] What is *not* being cultivated is the ability to be alone, to reflect on and to contain one's emotions. The anxiety which teens report when they are without their cell phones or their link to the Internet may not speak so much to missing the easy sociability with others but of missing the self that is constituted in these relationships". "The tethered child does not have the experience of being alone with only him or herself to count on". Rather, he/she has the parents to rely on, which are "on tap", through the mobile phone.

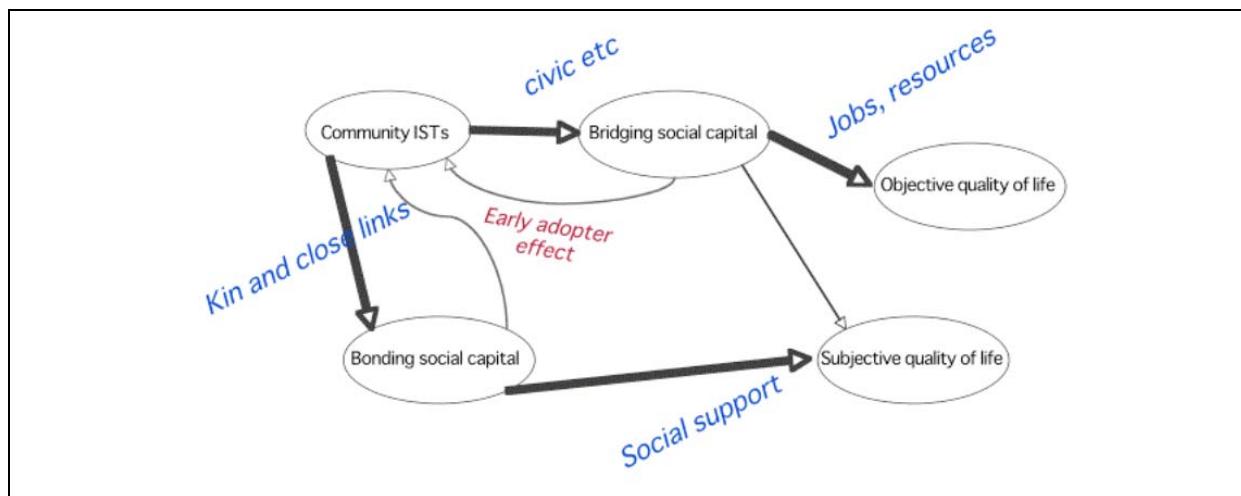
4.3.3 Empowering local communities

The role which ICT can potentially play for community-building has been formulated by Beale (2000): "At a deeper level, communities need to be able to learn about themselves, their world and from their mistakes and successes" (p. 60). ICT can provide support for "...self-knowledge: of people, places, cultures and of resource usage; community memory and history via the knowledge of events over time; (and) the learning function: the ability to construct meaningful knowledge from data, facts and events."

In spite of ICT networks inherent "space-less" character, there is indeed much evidence that ICT use is heavily related to a specific place: Current estimates suggest that up to 80% of the information available on the Internet directly relate to a specific place in geographic space (Davies, 2004). To what extent, however, is there evidence that local community directly benefit from ICT use – general use as well as initiatives which are explicitly intended to strengthen community?

Gaved & Anderson (2006, p. 8-13) provide a "short history" of local ICT initiatives in their assessment of the impact of such initiatives on social capital and quality of life. Figure 15 represents the conceptual model used for this purpose.

Figure 15: Conceptual model for analysis of local ICT initiatives' effect on social capital



Source: Gaved & Anderson (2006, p. 7)

Gaved & Anderson distinguish broadly between grassroots initiatives and activities initiated by the public sector, sometimes in the form of public-private partnerships. Grassroots driven initiatives themselves can be divided into three broad categories:

- Pioneers: technological innovators and early adopters exploring ICTs within the context of community usage;

- Subcultures: technology innovators and domain experts using ICTs to support communities of interests which are in part socially bound by the locality;
- Cooperatives: community based groups exploring ICTs for their potential ability to support neighbourhood needs and purposes (cf. Gaved & Mulholland, 2005)

Consistently, researchers have noted higher levels of civic involvement corresponding with higher Internet usage (Shah, Mcleod & Yoon, 2001; Hampton & Wellman, 2003; Cordell & Romanow, 2005), even after controlling for the influence of socio-demographic variables. A study by Williams, Wallace and Sligo (2005), which included data on the motive for using the Internet, found that these motives are a more important determinant for civic engagement than the amount of time spent online.

Analysis of data from the e-Neighbor project, which included detailed, longitudinal social network surveys over with the residents of four contrasting neighbourhoods over a period of three years (Hampton, 2007), found that neighbourhoods with higher rates of social capital were more likely to take up ICTs for community-building purposes than other types of neighbourhoods. Interestingly, "within neighborhoods, those who have smaller networks on average, and consequently are the most likely to have a deficit of power and access to information, are the most likely to participate [in a local e-mail list]" (Hampton, 2007, p. 740).

"Grassroots initiatives are often found in 'elective' communities where there has been a history of community cooperation and strong local social ties." (Gaved & Anderson, 2005, p. 19)

With regard to civic awareness and civic engagement, Pinkett (2003) found from research in the U.K. that after the first year of operation of an ICT for community scheme, civic awareness amongst users was greatly enhanced, for example knowing the skills and abilities of other residents (up from 11% to 32%), volunteer opportunities in the community (up from 0% to 42%) and community activities and events (up from 11% to 58%).

Gaved & Anderson (2006, p. 15), however, stress that a focus on short-term changes, often explored as part of an initiative in the form of accompanying research, can be misleading: "The initial results of engaging a community with a local ICT initiative are often encouraging. External funding to alleviate real or perceived deprivation is likely to be well received, and benefit at least a proportion of the community. Even those members that are not directly benefiting are likely to approve of positive community interventions, and it is likely that any form of ICT intervention will result in an increase in some measures of social capital and quality of life indicators. Community activism itself implies a generation of social capital and is likely as a result to help improve quality of life indicators such as the development of interpersonal relationships, community involvement, a sense of contribution to the community and involvement in local issues."

"it is important to remember that it is the stage in the lifecycle of the community at which data is gathered that will determine how successful the community appears to be" (Gaved & Anderson, 2006, p. 28): While initial results of engaging a community with a local ICT initiative are often encouraging, the maintenance of the community once initial sources of funding have dried up is often a major challenge:

Early indications suggest that sustaining ICT initiatives can be a major issue not always considered at their launch. Exogenous ICT initiatives may only be funded for a limited timescale and resources withdrawn, grassroots initiatives may fail due to technical or social reasons. The ending of the ICT initiative may in itself cause difficulties through the withdrawal of ICT access or support; and furthermore this may lead to reverses in social capital or quality of life indicators initially enhanced by the initiative; the benefits may wear off. In some cases, initiatives may be appropriated by host communities and continue in a different guise, or alternately they may cease to operate. Little research appears to have been carried out in this area and we can only make general hypotheses about what might happen. (Gaved & Anderson, 2006, p. 14)

Moreover, later adopters within community ICT initiatives tend to be less interested in civic engagement but rather use ICTs for gaining benefits in terms of convenience and efficiency (Kavanaugh, 2001). "Initial reports from local ICT initiatives are usually highly positive. Initiatives are started in the belief that they will succeed and generally report early successes." (ibid., p. 14)

"Exogenous IST initiatives may be more at risk of failing after their funding has finished, by comparison grassroots initiatives, funded from within the community at much lower levels and with a higher degree of inkind and social capital may continue indefinitely" (Gaved & Anderson, 2006, p. 23)

Williams, in his research in socially excluded communities in Manchester, found that groups with more bonding capital were associated with higher ICT usage (Williams, 2005).

Pigg and Crank (2004) carried out a meta-analysis of studies on ICT and community social capital. For their analysis, the authors distinguish between the five components of the social capital concept, as developed within the literature (networks, resources for action, reciprocity transactions, bounded solidarity, and enforceable trust), and between the information and the communication function of ICT. "The results indicate that much work remains to be done before it can be said with any validity that ICTs can, in fact, create community social capital."

4.3.4 Participation and social inclusion

We discussed in chapter 4.2 the interrelation between Internet use, social capital and social networking. The discussion showed that there is a lot of support for the thesis that ICTs make it easier for people to maintain and develop their social networks. What, however, does available evidence say about the potential of ICTs to represent a means of social inclusion? Can ICTs make it easier for people who find it hard to stay socially included, or who are at risk of being excluded from society, to socially participate and gain access to the resources afforded by social capital?

Optimistic accounts, such as those by Katz and Rice, claim that "innovative uses of the Internet *build* what is commonly thought of as social capital" (Katz & Rice, 2002, p. 353; emphasis added). On the other hand, though, many observers still think that Putnam (2000) was correct when he stated that "anyone who thinks the Internet could restore social capital lost through other means is a wild-eyed optimist".

In fact, quite some empirical research (e.g. Millard & Christensen, 2004) suggests that ICTs are unlikely to create social capital and a sense of regional identity where these are undersupplied in the first place. Analysis of a major local ICT initiative, the Blacksburg Electronic Village, made Kavanaugh & Patterson (2002) conclude that "social capital may turn out to be a pre-requisite for, rather than a consequence of, computer mediated communication". Van Dijk (2006, p. 169) puts it more bluntly: According to him the Internet "supports those already strong in social contact, civic engagement and sense of community and it enables those weak in these things to further isolate themselves and to be excluded from the many opportunities the new media have to offer". If this was found to be true, it would be hard to sustain the claim that ICTs can have a positive 'impact' on societies with regard to the quality of social relations and the production of social capital.

At the level of the individual, a number of research studies have explored the effect of the Internet on social participation with a special view on the influence of personality traits. Most of this research finds evidence for what Ithiel de Sola Pool (1977) in her path-breaking study on the social impact of the telephone called "dual effects". The much-discussed longitudinal studies using data from the HomeNet experiment in the USA found that "among extroverts, using the Internet was associated with increases in community involvement and self-esteem, and declines in loneliness, negative affect and time pressure; *it was associated with the reverse for introverts*" (Kraut et al., 2002, p. 373; emphasis added), which makes them

conclude that the Internet may be beneficial to individuals only to the extent that they can leverage its opportunities to enhance their everyday social lives (*ibid.*, p. 377).

Research by Kavanaugh (2003, p. 423) on networked communities came to the same conclusion, which made her conclude that "If you predisposed to be asocial (unsocial, not antisocial), access to the internet does not make you suddenly sociable. It simply provides you with tools and services that allow you to interact with people without the embarrassment or discomfort of a face-to-face setting".

On the other hand, there is ample evidence that ICTs such as IM, e-mail and other text-based electronic communication can facilitate the development of relationships by helping introvert people (especially younger ones) to safely overcome social apprehensions (Hampton, 2007; Quan-Haase, 2007). In a laboratory study by McKenna & Seidman (2006), online and offline group interaction was analysed for socially anxious and non-anxious individuals. While extroverted participants showed similar levels of anxiety, acceptance and comfort in both offline and online interaction, introverted participants experienced significantly higher levels of comfort and acceptance in online interaction. There is no evidence, however, "whether these feelings of heightened communication efficacy would result, over time and repeated experience, in last increases in self-efficacy" (McKenna & Seidman, 2006, p. 281).

Some studies have also tried to show that Internet use has an effect on the likelihood of depression, in particular for individuals who are at risk of suffering from lack of sociability. Ford & Ford (2009), using longitudinal household survey data from the "Health and Retirement Study" in the USA, conclude from their research that there is a "a positive contribution of Internet use to mental well-being of elderly Americans, and estimates indicate that Internet use leads to about a 20% reduction in depression classification". No comparable research is available for Europe.

Another way in which ICTs can empower people who feel difficulty in engaging in sociability as much as they would like is by enabling immigrants to keep in contact with relatives and friends in their home country (Williams, 2005). Indeed, members of ethnic minorities have been found to be among the most intensive users of advanced Internet applications to engage in distant communication, e.g. via voice-over-IP and conferencing (Zinnbauer, 2007). In order to use such tools, however, member of minority communities need to have the capability to use ICTs according to their specific needs – a topic we will now turn to.

4.3.5 Empowering minorities

The Institute for Prospective Technological Studies recently published a number of studies on take-up and use of ICTs by members of ethnic minorities in Europe. The research included a major literature review of available academic research (Borkert et al., 2009), as well as an overview of good practice (Haché, 2009), and an analysis of the national context and status regarding ICT supply and demand in France, Germany, Spain and the UK (Diminescu et al., 2009).

One of the main findings of this body of research is that "immigrants and ethnic minorities do not differ much from the host population if we consider ICT take up in general. [...] When considering how and for what purposes ICT are used and the surrounding social context, it emerges that digital exclusion of immigrants and ethnic minorities is the result of more general and multi-faceted processes of social exclusion. This also implies that access and use of ICT are not by themselves conducive to outcomes such as [...] economic and social participation and integration of immigrants and ethnic minorities." (Diminescu et al., 2009, p. 9). In other words, if immigrants suffer from lack of access to ICT and low digital skills, this is mainly to be explained by their low socio-economic status rather than by their status as member of an ethnic minority.

This also implies that well-off and high-educated immigrants are typically strong users of advanced ICTs, especially if they belong to younger age cohorts. Diminescu (2008) coined

the term 'connected migrants' for this group, who use ICTs to overcome the drawbacks commonly associated with migration as a process of uprooting and becoming detached from one's roots.

With regard to uses of ICT which are specific to immigrants and ethnic minorities, the research found that:

- "Immigrants and ethnic minorities use ICT intensely to stay in touch (known as 'bonding') with co-ethnics, mostly family members and friends, both in the host society and in the society of origin. Preliminary findings from the country reports do not rule out segregation effects of such usage patterns. However, overall they seem to support more the hypothesis that strengthening group cohesiveness and identity through the use of ICT is mostly positive and conducive to more confident participation in the host society (known as 'bridging' social capital).
- ICT skills are clearly perceived by immigrants and ethnic minorities as crucial for enhancing their job prospects and they play an important role in many businesses they run. The first exploration of ICT appropriation motivations and patterns among immigrants and ethnic minorities found a widespread perception that knowing how to use ICT is an essential prerequisite for educational and job success in the European labour market. Using the Internet (and having an email address) is seen as important for the effectiveness of the job search process itself. [...] Many people from migration backgrounds also run their own businesses that often involve international transactions where ICT support is crucial (e.g. email and Internet-based phone services) and they use digital audio-visual content from the countries of origin" (Diminescu et al., 2009, p. 9-10).

Within the context of the present project, an empirical study of the role of ICT use for student immigrants who recently moved from Eastern Europe to Germany was carried out. The results are presented briefly in the box below, as well as in a separate chapter in the Annex (section 7.1).

A study into young immigrants' use of the Internet¹⁷

The empirical study explored the extent to which fresh immigrants in Germany make use of social networks to tackle the typical challenges surrounding a move across national borders, and the role which the Internet plays in this context. The research interest was not so much in online communication with 'backward links', i.e. relatives and friends left back in the home country, but mainly in how the Internet is used at the destination to create a personal social network consisting, on the one hand, of ties to people of the same nationality and fellow migrants and/or, on the other hand, ties to people outside the primary group.

The explorative study consisted of in-depth interviews and focus groups with 18 young immigrants (mostly students) from three East European EU countries (Bulgaria, Lithuania, Latvia) and Russia. Fieldwork took place in late 2008.

The nature and extent of barriers that people face who are in the process of migration depend, on the one hand, on the preconditions of the move and, on the other hand, on the efficiency of already existing social networks in the host country – if there are any. Equipment with financial and human capital, the individual motivation for the move, and existence of language skills are all part of the preconditions. The most common challenges faced were related to language problems, search for accommodation, and coping with administrative formalities. In general, three different strategies were chosen to tackle challenges: institutionalised aid, use of financial capital and use of social capital. As financial capital was very limited in all cases, the use of social networks was of major importance for getting along. Resources accessed through social networks included direct physical support, for

¹⁷ The empirical research was carried out by Julian Stubbe within the context of the present study.

instance a place in an apartment, or context-specific information, for example about jobs opportunities or how to deal with certain administrative procedures.

In the absence of established social networks in the host country, all interviewees sought to extend their networks, e.g. via approaching persons at the job or at university; engaging in a migrant club or society; or making contacts at informal occasions such as parties. Only rarely were existing networks used to meet new people. Interviewees reported that they felt it important to broaden the range of contacts they have, as a means to access a wider range of resources.

The Internet played an important role in all of the above. There was migration-specific Internet use insofar as social online applications were perceived as a tool which enable fresh immigrants to overcome restrictions and inhibitions of face-to-face communication in the host country. The extent to which migrants were successful in doing so appeared to depend on individual communication behaviour and general attitudes towards online communication. All interviewees understood the Internet as a means for adapting to a radically new life situation.

The most common applications used were e-mail, online social networks and communities, VoIP, instant messaging and forums. A sizeable minority of interviewees reported that they met somebody face-to-face whom they initially got to know online. The most common use of online communication was for consolidating contacts with people whom they had (however fleetingly) met before in physical space. In many cases, face-to-face communication was extended into the online sphere, e.g. when unfamiliar situations required clarification by a third party.

In sum, the role which the Internet played for the creation and utilisation of social capital by the immigrants in the study can be compared to an amplifier that supports the establishment of new social networks and helps to consolidate them. In addition, using the Internet migrants found it easier to close information gaps prior to the move as well as afterwards. In this, the role of recommender and reputation tools, which are typical of so-called Web 2.0 applications on the Internet, is to provide what has been called socio-technical capital (Resnick 2005). In the absence of traditional 'weak ties', users of socio-technical capital exploit the Internet's capacity to match interests, preferences, behaviours, and the like across large numbers of anonymous individuals.

From a policy viewpoint, the main question appears to be how the Internet and other ICTs can be used to support integration of ethnic minorities in the host society:

The central question is how ICT can help to create bridging social capital and how supportive policies can help to create a shared experience and an online meeting point for individuals from different ethnic communities as a basis for dialogue and a starting point for exploring common interest and weaving networks. In other words, what is the virtual equivalent to neighbourhood football, an initiative that very effectively brings together a diverse range of people that have otherwise not much in common. Finding ways to make online public services more accessible to ethnic minorities is another challenge. A starting point is to take advantage of the relatively low costs for online publishing and make essential public service information available online in languages of major ethnic minorities. This does not only lower practical access barriers, but also comes with a psychological benefit in the form of strengthening the feeling of not being overlooked and of having a stake in the institutionalized governance system of the country. (Zinnbauer 2007, p. 36-37)

The good practice overview provided by Haché (2009, p. 16) found that the role played by ICT in initiatives focussing on ethnic minorities can take several shapes. The most widely practised are:

- initiatives which offer access to ICTs, and provide the necessary skills to use them;
- schemes focusing on adapting existing online services to the specific needs of ethnic minorities and immigrants
- schemes focusing on developing ICT-based services tailored to the needs of ethnic minorities and immigrants, such as: language learning; training for finding a job; online job centres for non-nationals; finding accommodation; one-stop municipal information services aimed at immigrants; and online integration services for third country nationals.

"Another interesting group of practices are those providing a whole set of services (house searching, training, ICT skills, job and house searching, leisure and free time etc) by adopting a holistic approach in order to support the variety of social needs expressed by users particularly at risk of exclusion, like unaccompanied minor migrants [...] or asylum seekers [...]. Many initiatives use also ICT to enhance the 'voice' of IEM putting at their core the narratives and memories of their participants with regards to immigration flows, experiences and perceptions of the host society and other subjects. Working on these issues often improves the participants' social capital and their possibilities to engage in active citizenship [...]. Practices using ICT to enhance volunteering and exchange between IEM and host society have been also identified [...]. Finally, ICT primary role can also address daily needs of the intermediaries working with IEM such as teachers or trade unions: e-Learning platforms and contents to enhance the understanding of intercultural diversity [...]".

As is the case of community ICT initiatives in general (see section 4.3.3), the success of initiatives aimed at utilising ICT for empowering immigrants and ethnic minorities depends on a whole range of factors. It appears that the following are of critical importance: strong involvement of major stakeholders; link-up with grassroots activities; user participation in designing and further developing the initiative; evaluation and adaptation according to changing needs; and often also continuous financial support. In any case, policy-making can make a real difference by championing innovative approaches, and by mobilising private stakeholders for engaging in long-term public-private-partnerships (cf. Diminescu et al.. 2009).

4.3.6 Anti-social behaviour

We must not be blind to the fact that ICT also has an empowering effect for persons with deviant behaviour, including those with criminal inclinations. For example, the almost ubiquitous availability of the Internet and other ICT, in combination with the opportunities they offer for anonymity and lack of accountability, have lead to the phenomenon of cyber-bullying, which is understood as:

[...] A negative phenomenon that arises out of collaborative content is the possibility for insulting and traumatising contents. The ease with which content can be created and published with new tools may lead to less critical thinking in the process. It is easy and fast to send angry blog posts or funny embarrassing videos and pictures of neighbours, classmates, teachers, and public people for everybody to see, but the consequences may be damaging. The [so-called] McCann case of a missing child showed a tremendous number of blog postings, where people took a stand on the case, without knowing all the facts of the ongoing police investigation. There are cases of cyber bullying of both students and teachers through online materials, and educational institutions which have restricted access to collaborative content sites because of it. Concerns have been raised as to whether internet users may start valuing informal postings and ratings more than formal systems of measurement, and whether there are now new emotional challenges facing those working in public professions such as education (Ala-Mutka 2008).

In a representative survey of adolescents aged 12 to 24, conducted in the context of a major German study (Schmidt et al. 2009), 28% of all respondents reported that they had been bullied at least once when using the Internet, and 13% reported that photos or other personal information about them had been uploaded to online sites without their prior consent.

In general, ICTs such as the Internet and the mobile phone can be effective tools for antisocial activities. There can be little doubt that social pathologies related to Internet-based behaviour do exist, as Griffiths (2003) points out: "It is most likely that the Internet provides a medium for the 'addiction' to flow to its object of unhealthy attachment (i.e., a secondary addiction to more pervasive primary problems. The Internet can easily be the focus of excessive, addictive, obsessive and/or compulsive behaviours. One thing that may intensify this focus are the vast resources on the Internet available to feed or fuel other addictions or compulsions" (Griffiths, 2003, p. 277-8).

As one would expect, robust empirical evidence about pathological computer and Internet use is rare. For example, Mörsen (2009) reports that estimates about the share of adolescents suffering from Internet-related addictions ranges between 3% and 66%, depending on research methodology used and definitions applied. Moreover, evaluation of the Internet's impact in this area are made difficult by the fact that Internet addiction disorder is considered by most scholars not as a true addiction, but rather as a symptom of other, existing disorders. A recent meta-study of academic Internet addiction research (Byun et al., 2008) came to the conclusion that most research in the area suffers from significant, multiple flaws: "The analysis showed that previous studies have utilized inconsistent criteria to define Internet addicts, applied recruiting methods that may cause serious sampling bias, and examined data using primarily exploratory rather than confirmatory data analysis techniques to investigate the degree of association rather than causal relationships among variables". This does not mean, of course, that Internet-related pathologies do not exist, but just that they are hard to measure, and that the Internet's role may be overestimated due to the Internet's application for practices related to existing disorders.

4.4 Education & lifelong learning

Online sociability and social networking play an important role in current debates about the way people acquire the skills which are required in the knowledge-based society and economy.

While social networks play a strong role in formal education¹⁸ as well (witness the success of pupil and student networks such as StudiVZ in Germany, as well as the controversy around collaborative rating of teachers), the present Domain Report will briefly describe developments in the area of incidental and experiential learning based on ICTs.

In recent years, a number of authors have suggested that rather than these, it is incidental (experiential) learning which is the most important way in which people acquire skills, thereby implying that such learning is capable in theory to fulfil a similar function as more formal learning activities e.g. in courses (Tuomi, 2006).

Focusing on the skills needed for mastering ICTs such as computers and the Internet, available evidence certainly confirms the significance of informal learning as opposed to formal, structured learning. The findings from the representative TRANSFORM 12-region survey (2008) suggest that social ties including family and friends, but also interaction with more remote acquaintances, play a powerful role in the exchange of ICT skills (see Table 4). A high level of social capital, if defined as existence of extensive networks of strong and weak ties, can therefore be expected to make it easier for a person to acquire the skills necessary for making full use of the potential of ICTs.

¹⁸ For a discussion of the relevance of ICT for learning within the formal education system, see Domain Report "Education and Lifelong Learning".

Table 4: Perceived importance of sources for ICT skills

	Percent for which this was of <i>essential</i> importance ¹⁹	Percent for which this was of great <i>importance</i> ²⁰	Importance: Mean on 10-point scale
School, college, university	15.3	31.9	5.75
Attending a training course provided by an employer	12.3	25.6	6.44
Attending a training course provided by (or on behalf of) a public agency	9.7	21.0	6.97
Learning on the job*	28.1	52.6	4.32
Help from friends and/or relatives	22.3	49.3	4.29
Self-study and trial & error	43.9	70.4	3.06

* = Respondents in employment only. Source: TRANSFORM (2008)

According to Table 4, initial education (at school, college or university) and formal training courses play an important role for a much smaller share of respondents compared to learning on the job (for those in employment), help from friends or relatives and, in particular, self-study and trial & error. The latter finding indicates that the ability to self-learn and the degree of learning self-efficacy (eUser, 2006) are likely to be of key importance for skill acquisition. Still, the role of friends and relatives for transfer of skills deserves a closer look.

The same survey also asked Internet users whether they *get help* from others – friends and family, people at work or place of education, people at public places such as libraries, people at Internet cafés, or a formal trainer in a computer course – for using computers and the Internet. Moreover, the survey asked whether respondents give help to any of these groups. The data reproduced in Table 5 suggest that regular Internet users are indeed an important source of support for their friends and family, with 71% stating that they give help to this group. But the transfer of skills is not limited to this group, as 61% also state that they give help to other groups of people – especially colleagues and co-students, respectively. Support in how to use computers and the Internet is, of course, not unidirectional – indeed, the largest group of respondents declare that they give as well as receive help from many of the groups listed.

Table 5: Transfer of ICT skills within the population

	Percent who give help for using computers / the Internet to ...	Percent who get help for using computers / the Internet from ...
Friends and/or family	71.0	60.0
Others besides friends/family	60.7	66.5

Source: TRANSFORM (2008)

These findings indicate that learning within social networks represents a vital source of skills.

¹⁹ Value “1” on 10-point scale (1 = essential, 10 = not important at all)

²⁰ Values “1” to “3” on 10-point scale (1 = essential, 10 = not important at all)

4.5 Discussion

4.5.1 ‘Evidence’ about ‘impacts’: A note about research methodologies

While it appears that a wealth of research is available for shedding light on the basic question the present report seeks to answer, i.e. what is the impact of ICTs on sociability in Europe, many of the studies undertaken may actually be ill-suited for the purpose. There are four main reasons why we should be careful before jumping to conclusions based on the available evidence:

- Much of the research relies on cross-sectional data rather than longitudinal data. This “makes it impossible to distinguish self-selection (in which socially engaged and disengaged people use the Internet differently) from causation (in which use of the Internet encourages or discourages social engagement)” (Kraut et al., 2002, p. 349).
- The little longitudinal data available is often limited to a short period in time. For example, the eLiving study used data for two points in time, one year apart, for analysing the effect of a shift to broadband on households. They found “no evidence that switching to broadband will have any effect on social leisure activities” (Anderson & Raban 2007, p. 59). Clearly, there is a need for research on medium- to long-term social changes related to the use of ICTs by individuals and households.
- Most of the studies which seek to establish evidence for an association between use of ICTs and parameters measuring sociability do not include indicators on personal traits. This represents a serious shortcoming, since personal traits are known to be major determinants of sociability related behaviour (Shklovski et al., p. 2006).
- Much of the early research typically compiled online activities into a single variable of Internet use or non-use. This disregards important differences in the nature of activities performed, as Quan-Haase (2007, p. 674) show (cf. Dutton & Helsper, 2007).

There is also a more fundamental issue with research on the ‘social impacts’ of a technological innovation, as Livingstone (2003, p. 209) emphasises. She notes that in media research, there has been a general movement away from attempting to analyse ‘effects’ and ‘impacts’. This came in response to the sustained criticism of a tradition which claims to be able to control the setting in which a technology is introduced by constructing a before-and-after research design – which in practice is often impossible. Media researchers today strive to explore the media environment, which means “mapping complex combinations of diverse media, and both the determinants and consequences of these combinations are of interest” (Livingstone, 2003, p. 209).

4.5.2 Summary of evidence

A key question the study wanted to address concerns the **impact of ICT on social capital**. This has been intensively discussed since the mid 1990s. The original proposition, mainly influenced by the publications of Kraut et al. and Putnam from 1998 and 2000 respectively, was that communication through the Internet “inhibits interpersonal collaboration and trust” and, as such, would be detrimental for social capital building and maintenance.

A 2009 article in “Biologist”, an academic magazine from the U.K., came to the conclusion that Brits as well as Americans “step back from one another in unprecedented magnitude”:

The rapid proliferation of electronic media [...] is now the most significant contributing factor to society’s growing physical estrangement. Whether in or out of the home, more people of all ages in the UK are physically and socially disengaged from the people around them because they are wearing earphones, talking or texting on a mobile telephone, or using a laptop or Blackberry. An increasing number of deaths caused by the wearers of MP3 players inadvertently stepping into oncoming traffic has led to Senatorial proposals for a New York State ‘distracted walking bill’ to outlaw the use of mobile phones, handheld emailing devices such as Blackberries and video games while crossing

a road. Senator Carl Kruger described how people walking around ‘tuned in’ were, in the process of being tuned in, being ‘tuned out’ to the world around them. The malady is referred to as “iPod oblivion”. (Sigman, 2009, p. 14)

The author goes on to quote the findings from the study by Kraut et al. (1998), published a decade ago in a much-discussed paper with the title “The Internet Paradox”, which found that greater use of the Internet was associated with declines in communication between family members in the house, declines in the size of their social circle, and increases in their levels of depression and loneliness.

What Sigman fails to mention, however, is that in the 10 years since then a wealth of research has established evidence for exactly the opposite effect of ICTs on sociability – including a follow-up study by Kraut et al. (2002) themselves. Katz & Rice (2002) summarised the findings of the research available at the start of this decade, which includes a number of their own studies.

Indeed, most of the empirical evidence produced since that time confirms the conclusions of Katz & Rice.

Whereas Sigman treats mobile phones and iPods as expressions of a general retreat from social interaction, he ignores a fundamental difference: Being immersed in mobile communication – and thereby often ‘lost’ for meaningful communication with those in direct proximity – is, in contrast to being immersed in listening to a walkman/MP3 player or in playing with a Gameboy – “not abstract or ego-centred absorption in another thought world; it is social intercourse. It is a conduit through which we maintain social interaction, and we have to pay it heed” (Ling, 2008, p. 113).

Today we find considerable evidence that ICTs such as mobile phones and the Internet enable people to manage their communication more effectively, with the result that users tend to agree almost through the board that ICT tools have made their life easier and/or more interesting. We can also be confident that most users benefit from ICT as the technology makes it easier to identify, get in touch with, and maintain contact with people who share their interests or background – what sociologists call “weak ties”. Although research focussing on social ties traditionally finds that stronger social ties generally lead to better social outcomes than weaker ties (Wellman & Wortley, 1990), there is much consensus that weak ties, i.e. less personal, indirect social relations underpinned by “thin trust” is “the basis for social integration in modern, large-scale society” (Newton, 1997, p. 579)(cf. Granovetter, 1973; Kavanaugh, 2003; Field, 2003). There is also evidence that weak ties are associated with a region’s or community’s capability to create innovation (Florida, 2002), which of course has become more and more important in recent decades not only for economic prosperity, but also for coping with the challenges of globalisation, social inclusion, and ecological sustainability.

The “Biologist” article, quoted above, is indicative of a general tendency, in much of the public discourse, to portray Internet activities (as well as activities using other ICTs) as somehow ‘not real’ or ‘not social’. Nothing could be further removed from the truth.

But there is of course some truth in Sigman’s observations. It is indeed highly likely that, for the majority of Europeans, a substitution of mediated communication for face-to-face contacts is taking place²¹, and the unintentional effects this is having on people will need to be followed closely (Small & Vorgan, 2008). People in the streets communicate less with the strangers they encounter because they are indeed immersed in making mobile phone calls, reading and sending electronic messages, and generally trying to master their increasing range of (mobile) personal communication applications (Ling, 2008). Research is needed to

²¹ See, for example: Hampton (2007)

shed more light on impacts in this area, and how negative effects can be mitigated using effective solutions – possibly themselves based on ICTs rather than advocating using it less.

The ease with which people can enter into social interaction of their own choice, enabled by ICT, can also bring problems itself, some of which have to do with the friction between individualization and human's need for community. Ulrich Beck's saying that we are "condemned to individualization" (Beck, 1994, p. 14) takes on a new meaning in the face of what Turkle calls 'tethering' ICTs: We constantly "live with a heightened sense of potential relationships, or at least of new connections" (Turkle, 2008, p. 124). Increasingly, "one needs good cause to claim time offline. The pressure to be always-on can be a burden" (*ibid.*, p. 126). "To make more 'time' in the old-fashioned sense means turning off our devices, disengaging from the always-on culture. But this is not a simple proposition since our devices have become more closely coupled to our sense of our bodies and increasingly feel like extensions of our minds" (*ibid.*, p. 132).

Another challenge is related to the use of ICTs for antisocial purposes. There can be little doubt that social pathologies related to Internet-based behaviour do exist, although most of them appear to have their cause in existing disorders, rather than use of the Internet itself. It is also certain that the Internet provides criminals and others with an anti-social disposition with tools and services which they can use to increase – sometimes radically so – the effectiveness of their deeds (Mansell & Collins, 2005).

A final, more complex type of challenge is related to the spread of ICTs and their use for social interaction is posed by its implications for social cohesion and social inclusion. Indeed, based on the empirical evidence taken into account so far for the present report, it remains open whether ICTs not only transform patterns and processes of sociability, but whether they also transform patterns and processes of social inclusion, as manifested in the different capability of people to make use of technology for achieving personal goals and gaining access to social (and economic) resources. In contrast, the possibility cannot be ruled out that ICTs make it even more difficult for people at risk of social exclusion to improve their situation.

As Robert McChesney noted back in 1996, then talking about the USA: "In a class-stratified, commercially oriented society like the United States, cannot the information highway have the effect of simply making it possible for the well-to-do to bypass any contact with the balance of society altogether?" (McChesney, 1996, p. 117). Indeed, the much-publicised, longitudinal study from Kraut et al. (2002, p. 373) found that heavier Internet use was associated with "declines in local knowledge, and declines in the desire to live in a local area, suggesting lowered commitment to the local area". Since no comparable studies are known to the authors of the present report, we cannot say whether a similar study would come to the same finding in some or all European countries.

Robert Putnam (2000) called the developments associated with the trend towards increased individualisation and decline of people's ties to others who do not share their background or interests "balkanization". He suggests that communication technologies, such as the telephone, mainly reinforce existing ties but cannot provide the basis for social cohesion in larger, geographical communities. Kluth, discussing ICT-based "nomadism", concludes: "Nomadism, most believe, tends to bring people who are already close, such as family members, even closer. But it may do so at the expense of their attentiveness towards strangers encountered physically (rather than virtually) in daily life. That has implications for society at large." (Kluth, 2008, p. 4). "As it is increasingly easy to bond through the Internet with others on the basis of (sometimes extremely) specialized interests, it is also increasingly easier to shut off the rest of the world, which may cause a high degree of fragmentation of the 'public interest' and a diminishment of social cohesion" (Frissen, 2004, p. 47).

In this context, Valerie Frissen identifies in her overview of the impact of ICTs on civil society (Frissen, 2004, p. 49) as the main challenge for policy-making "the transformation or reinvention of social capital within the civil society. What we see here is that citizens have

started using the Internet to build new types of social relationships and networks. More fundamentally, in the long run this may bring about new kinds of behaviour such as networked individualism and de-contextualized interaction." She stresses that such developments are of direct relevance to the activities of the European Commission in the area of Ambient Intelligence:

In these scenario's people are surrounded by intelligent intuitive interfaces, which are capable of recognising and interacting with different individuals. These developments will take the trend towards de-contextualised, networked individualism even further. If this vision of ubiquitous technology, melted together with the everyday life routines and rhythms of European citizens in a seamless and unobtrusive way, is to be realised, which seems to be the ambition of the EC, we need to know how this vision will translate into future behaviour. In this case, we need to know what these future developments imply for social capital, civic engagement and the local and global civil society, which will in turn impact the democratic balance between state, market and civil society. (Frissen, 2004, p. 49)

Without doubt, we have only started to understand what ICTs impact are on the social life of Europeans. Emerging technologies will put great pressure on the capability of Europe's researchers to explore potential and actual impacts, and to provide valuable input to policy-making.

5 Conclusions and Policy Implications

Social uses of ICT introduce new societal challenges, and tackling them will often require some form of policy intervention. There is a lot of debate, of course, about how such intervention should be designed in order to best succeed in meeting policy goals (not to speak about lack of consensus about policy goals themselves).

One thing is for sure: In spite of the many difficulties and risks which the virtual domain has introduced for society, turning back is not an option: The Internet and mobile communication have become an integral part of the way people relate to each other, and there will be no return to a life in which social interaction was mainly based on face-to-face interaction, postal mail and the terrestrial phone. In the words of Sherry Turkle (1995): "To the question 'Why must virtuality and real life compete – why can't we have both?' the answer is of course that we will have both. The more important question is 'How can we get the best of both?'".

The **first** challenge to be mentioned is that – in spite of the research evidence which suggests that ICTs do at least not harm social capital – we must not forget that it is indeed highly likely that, for the majority of Europeans, a **substitution of mediated communication** for face-to-face contacts is taking place. The unintentional effects this is having on people will need to be followed closely. People in the streets communicate less with the strangers they encounter because they are indeed immersed in making mobile phone calls, reading and sending electronic messages, and generally trying to master their increasing range of (mobile) personal communication applications.

Stronger dependence on mediated communication might also introduce health risks, such as those associated with exposure to electromagnetic radiation. While most research appears to indicate that this particular risk is minor in comparison to the benefits derived from mobile telephony, it will be necessary to continuously invest significant effort into observation of technology trends and usage patterns, and the negative medium to long term impacts these might have on society. The intention is not to stifle ICT-based innovations, but to enable the wider public to engage in a well-informed, open dialogue about emerging risks, and how to deal with them.

A **second** challenge is related to the use of ICTs for **antisocial purposes**. There can be little doubt that social pathologies related to Internet-based behaviour do exist. It is also certain

that the Internet provides criminals and others with an anti-social disposition with tools and services which they can use to increase – sometimes radically so – the effectiveness of their deeds. There are ways how to address such threats, but they tend to affect individual rights such as data privacy and information autonomy. The societies of Europe need to seek a new balance between the freedoms and the risks introduced by ICTs such as the Internet.

A **third** major implication of our research into the social impacts of ICT is that the Internet and mobile phone, and the emerging convergence between both, present a great boost to **transparency**. While transparency is usually welcomed insofar as, for instance, people's ability to check on the activities of government and the corporate sector is concerned, it also means that personal information about individuals can more easily be exploited for unwanted commercial purposes, for exerting control, or for malicious activities of all kinds. The costs for **screening individual behaviour** have collapsed thanks to more and more human activity taking place online and/or with the help of a mobile computing device.

The risk does not only concern data privacy, i.e. that personal information is made public or used without consent of the individual in question. It also concerns **users becoming prisoners of their past actions**, as the data footprint which individuals leave in cyberspace cannot easily be controlled and corrected. A typical example are teenagers, who tend to have little qualms about uploading data on personal behaviour online, risk to become victims of their exploits later, as when potential employers seek information on job candidates on the Web. As Zittrain (2008, p. 232) states, "People might make rational decisions about sharing their personal information in the short term, but underestimate what might happen to that information as it is indexed, reused, and repurposed by strangers".

Policy-makers should investigate possibilities for innovative strategies to address these problems. Some scholars have come forward with proposals for introducing an 'expiry date' for (personal) data on the Internet (Mayer-Schonberger, 2009). This would be needed in order to let society regain control over what he terms the "perfect remembering in the digital age". In the same vein, other experts have asked for the possibility of making a "clean slate" in order to regain the ability to build a good reputation online: "People ought to be able to express a choice to deemphasize if not entirely delete older information that has been generated about them by and through various systems: political preferences, activities, youthful likes and dislikes" (Zittrain, 2008, p. 229).

A **fourth** issue to be mentioned here is also related to applications of social computing. It has become obvious that Web 2.0 users risk to become overtly dependent on individual service providers, the conduct of which is naturally guided by commercial considerations rather than the public good. If this results into **user lock-in**, this will have far-reaching implications for data security, consumer rights, and the ability for market newcomers to succeed in pushing innovations. A number of much-publicised incidences, in which social networking and web mail providers lost private user data (such as archived mails), showed that data stored "in the cloud", i.e. on providers' servers rather than users' PCs, are not safe. Moreover, as commercial providers are free to change features of their social networking services as well as the conditions for their use, users may want to change to another provider which offers a more attractive service.

Users may also need to look for an alternative in the case that they are excluded from using a social networking site as a result of changes to the "small print". In both cases, this would imply – under current conditions – that the person in question lost access to her personal data which she has stored on the social networking site. This appears increasingly unacceptable given the importance which users attach to their social online identity. Europe needs to explore the case for new regulation which would give users the **right of data portability**, i.e. extracting their personal data from a social networking site, for example in order to switch to an alternative service. Moreover, market players should be asked to provide more transparency about the way in which they will treat users' data in the case they shut down or sell the service, or make fundamental changes to conditions of use.

A **final** major challenge is related to the spread of ICTs and their use for social interaction is posed by its implications for **social cohesion and social inclusion**. Indeed, based on the empirical evidence taken into account so far for the present report, it remains open whether ICTs not only transform patterns and processes of sociability, but whether they also transform patterns and processes of social inclusion, as manifested in the different capability of people to make use of technology for achieving personal goals and gaining access to social (and economic) resources. In contrast, the possibility cannot be ruled out that ICTs make it even more difficult for people at risk of social exclusion to improve their situation. When what “we are witnessing [is] a new form of sociality in which the connectedness that ‘matters’ is determined by our distance from working communications technology” (Turkle 2008, p. 122), policy needs to make sure that this distance is as small as possible for everybody – distance here not being limited to the geographic meaning, but also including remoteness caused by lack of skills, spending power, social status, psychology, etc.

In this context, the distinction made in our research between **different types of social ties** and social capital is of high importance. We argue that ICT has a strong positive effect on both **bonding** and **bridging social capital**, but that effects are much less conclusive with regard to **linking social capital**. Policy action at all levels of governance, particularly at the local level, should try to establish effective ways in which the potential of ICTs can be exploited for improving communication between people from different backgrounds. Examples include efforts to improve integration of ethnic minorities. The potential appears to be particularly large as far as younger generations are concerned, as these are much more likely to full-heartedly embrace social uses of ICT and to integrate these seamlessly into their social behaviour patterns. Linking social capital is vital for social sustainability in Europe, but it will not automatically be created or strengthened by ICTs. Public intervention for fostering social innovation will be necessary.

6 Literature

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7 Annex

7.1 Young Migrants' Use of the Internet – An Empirical Study (by Julian Stubbe)

7.1.1 Introduction

Background and relevance

The central question of the analysis was which role the Internet plays for young immigrants' creation and use of social capital and to what extent online tools allow to build up relationship and contacts outside the personal intra-ethnic network.

Social capital are resources embedded in a social structure which are accessed and/or mobilised in purposive actions (Lin, 2001b, p. 12). This analysis is about whether these social networks can be extended, maintained or used via the Internet and if by that migration specific actions are supported. Hence, subject of the analysis is not so much the 'backwards' communication with relatives and friends in the home country, but foremost how the Internet is used at the destination for 'opening up' a new spatial and social environment for the migrant.

The UNESCO defines migration as (Meyer, 2008, p. 35):

'A process of moving, either across an international border, or within a state which results in a temporary or (semi-) permanent change of residence.'

This broad understanding has also been applied in this work. A major characteristic of the 'Age of Migration' (Castells & Miller, 2003³, [1993]) is the increasing diversification of migration movements. This does not only hold true for a displacement of the main countries of origin and destination, but also regarding a differentiation of socioeconomic backgrounds of immigrants (Martin & Widgren, 2002).

In recent years, the interrelation between the topics information society (Castells, 1996) and migration has started to enter the European political agenda. The potential benefits of the Internet for social integration and its potential contribution to cultural diversity were articulated at the 'Riga Conference' 2006. The Riga Declaration signed at the conference emphasises the need for (European Commission, 2006, p. 4):

'Fostering pluralism, cultural identity and linguistic diversity in the digital space.'

Furthermore it says:

'Improving the possibilities for economic and social participation and integration, creativity and entrepreneurship of immigrants and minorities by stimulating their participation in the information society.'

These political objectives can be understood as a call for research to better understand the usage of the Internet for migration specific purposes and social actions. One step in that direction has been taken by the Institute for Prospective Technologies Studies, Sevilla which is carrying out extensive research on the subject. The first report stemming from this research, released at the end of 2008, states (Kluzer et al., 2008, p. 32):

'[The] lack of knowledge on users, usages and impact makes it difficult to assess the relative contribution to the Riga goals for cultural diversity of policy-driven projects.'

This shows that there is a necessity to learn more about how immigrants are using the Internet, and if there actually is a 'migration specific' usage of the Internet. This would allow us to make statements about what the positive impact of online applications for social

inclusion might be, and how these should be designed and disseminated to achieve the expected impact.

Subject of the analysis

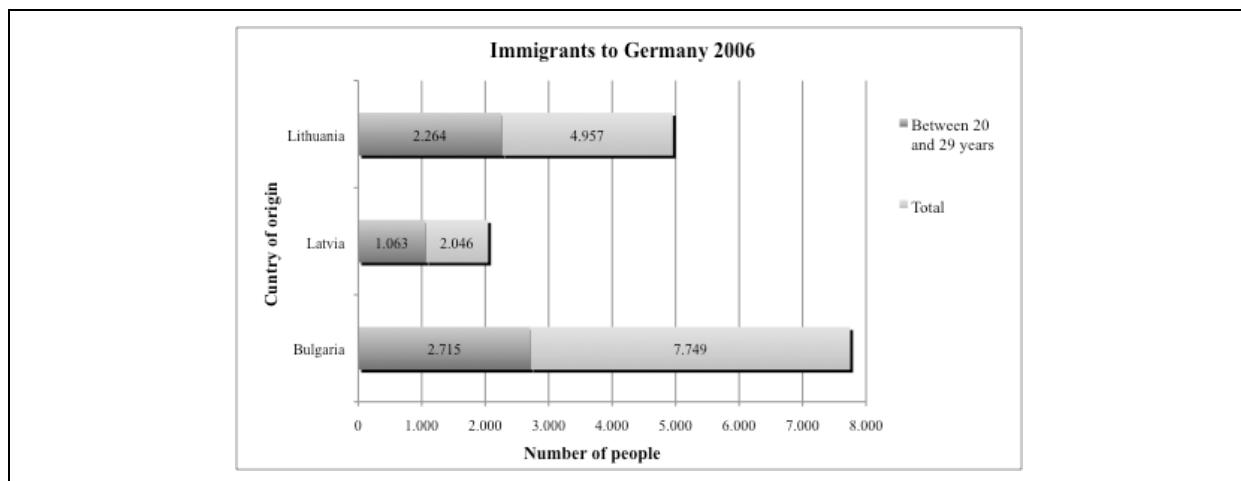
Our empirical research concentrated on a very small segment of the intra-European migration movements. Compared to the majority of global migration streams, movements of people within the European Union take a sort of exceptional position: Whereas governmental interventions and regulations usually seek to limit and manage migration flows, it is an accepted goals of the European Union to stimulate the cross-border mobility of citizens within the Community. The Treaty of Maastricht is considered as the strongest multilateral measure to increase cross-border movements. According to the Migration Outlook of the OECD (2008), intra-European movements are dominating within the Union, making up 60 per cent of all immigrations.

The subject of our research consists of young immigrants from three New Member States of the EU. Most interviewees were students who have lived in Germany for more than two years and are below 30 years of age. According to data published by the OECD, migration flows of foreign students within the EU have between 2000 and 2005 increased by approximately 50 per cent. There is a strong demand for more research insight into this particular group of migrants(OECD, 2008, p. 3):

'Although international students are a potential source of highly skilled labour migrants for OECD countries, there is no systematic data as yet on stay rates [...].'

Except for one person all interviewees came from Bulgaria, Lithuania and Latvia (see Figure 16). Migrants from these countries represent a relevant share of the total immigration to Germany, especially considering the relatively low total population of these countries.

Figure 16: Immigrants from Bulgaria, Lithuania and Latvia in 2006 – Total numbers and share of 20-29 year olds



Source: Eurostat - <http://epp.eurostat.ec.europa.eu/>; downloaded on 03. Nov. 2008

Additionally to age and country, another criteria for choosing interviewees was that they should be higher educated, as this group is more likely to have made some experience with the Internet already.

An important detail that distinguishes our investigation from previous ones (cf. Cachia et al., 2007; Hiller & Franz, 2004; Kluzer et al., 2008) is that it does *not* focus on 'online communities'. Online communities are defined as groups which came together on the Internet, and where all communication and interaction takes place online (van Dijk 2001², p. 167). The persons we have interviewed, however, are people who make use of the Internet mainly in order to cope with challenges of the migration process. Thus, the benefits (and

disbenefits) resulting from their online communication have to be analysed in their everyday social and spatial environment rather than in 'cyberspace'.

7.1.2 Approach

Our approach implies integration of three components: social capital, Internet usage and cross-border migration. The component 'migration' is connected to the other two in the sense that it is the 'migration-specific social capital' and the 'migration-specific Internet usage' which are of interest here. Nevertheless, the theoretical foundation of the approach has its source in concepts of social capital and theories regarding information and network society.

With regard to the concept of social capital a network perspective was followed, as proposed by scholars like Nan Lin (2001a) and Ronald S. Burt (1992). This allowed us to apply an analytical approach which focuses on the individual, thereby differentiating between individual benefits of closed and open networks, in the sense of resources that can be accessed through either personal intimate networks or by bridging 'structural holes' and building relationships to people outside the primary group. We applied this notion to the analysis of networks of migrants and of the benefits of intra- or inter-ethnic networks. It is assumed that (1) beside bonds created by identical nationality, the feeling of being in a challenging situation which is shared by another person is an important bonding momentum of migrant networks. We hypothesize that such bonds often lead to social support being given. We also assume that (2) it is not *either* open networks or closed networks, but the combination of both forms that is most beneficial from the individual migrant's point of view.

Concerning the understanding of social impacts of information technologies this individual perspective of social capital can be best linked to the conceptual works of Jan van Dijk (2001², [1999]) regarding the so-called 'network society'. Unlike Castells (1996), who considers networks as the substance of society and thus makes the network itself the most important entity of his analysis, van Dijk constitutes that it is still individuals, couples, groups and organisations who form the basis of society and hence must be subject to research. He states (2001², [1999], p. 241):

'Even a totally mediated society, where all relations are fully realized by, and substantiated in, media networks, where social and media networks equal each other, would still be based on bodies, minds, rules and resources of all kinds.'

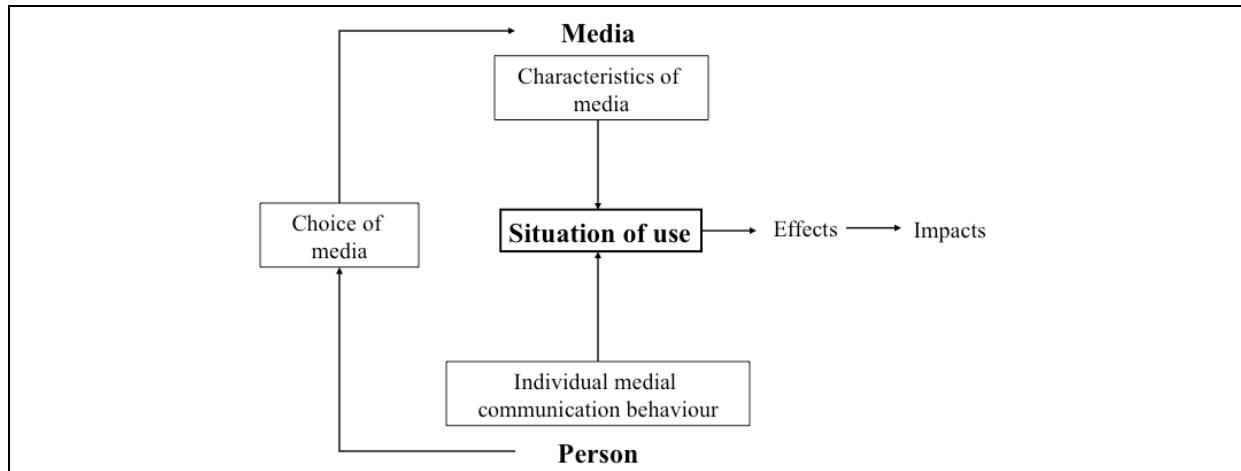
This perspective corresponds with the concept of 'networked individualism' by Barry Wellman (2001a). Wellman sees networks and individualization as a conceptual couple. While the cultural process of individualization set in long before the advent of the Internet in western societies, it is currently being substantially amplified by social and media networks (van Dijk 2001², p. 168). Networked individualism means turning away from place-to-place communication in favour of person-to-person communication via the Internet and mobile telephony (2001a, p. 238 ff.). The process of individualization is amplified by the possibility of a mobile lifestyle within 'sets' of physically disperse relationships.

This concept offers some notional links to the topic of migration. It could be assumed that the Internet offers young immigrants the possibility to overcome the physical distance between home and destination country, by allowing them to maintain the same sets of relationships as prior to the movement – with the only difference that social interaction would now mainly or exclusively taking place in the virtual domain. While few would argue that communication in cyberspace can make physical location completely irrelevant, the Internet at least in principle offers the potential to substitute virtual for face-to-face communication. But what does observation of real-world practice tell us?

For our investigation we mainly focused on instrumental use of the Internet, analysing the benefits of a certain communication channel for a specified purpose connected with dealing with migration-related challenges. The individual situation of use, which is critical for the choice of media is illustrated in the media-ecological framework by Nicola Döring (2003², Figure 17). In her model the choice of media is influenced by the degree of access to a

certain communication channel and the individual behaviour regarding mediated communication. From this and the specific characteristics of the media follows a 'situation of use' that brings about short-term as well as long-term impacts (Döring, 2003², p. 186 ff.).

Figure 17: Media-ecological framework by Döring (2003²)



Source: own translation of Döring 2003²

This model designs an instrumental perspective of media usage. Depending on the person and the implications of the media effects and impacts are caused that (as far as possible) match the positive expectations of the user. This is very suitable regarding the central question of this investigation as it corresponds with Coleman's (1991) postulate that the creation and usage of social capital has to be understood as purposive actions. This aspect is expressed very well in Dörings' model. What has to be criticized about the model is that the social context in which the medium is used is neglected. But especially for a migrants' situation this aspect should be rather important as his or her social environment is a new or even strange one and thus will certainly influence the situation of Internet use. Nevertheless we will not do without Dörings' model as it is of support for the understanding of individual media usage as a social action. As a suggestion we can summarize the social context under 'person' as she or he is inevitably embedded into these.

7.1.3 Migration: The Internet and the Crossroads of Space and Identity

Use and employment of communication media take a central function within the migration process. The manner of communication and access to information do not only influence the movement itself, but they also shape the formation of ethnic communities at the destination. Robert E. Park already explored this phenomenon in his work from 1922 about the meaning of the ethnical press within urban milieus. From his finding that immigrants tend to read more news after their move than they did when still at home, he followed: (1971, [1922], p. 9):

'News is a kind of urgent information that men use in making adjustments to a new environment, in changing old habits, and in forming new opinions.'

For Park this statement is strongly connected to the social support among migrants, who are living together in a new environment (1971, [1922], p. 6):

'Each one of these little communities is certain to have some sort of co-operative or mutual aid society, very likely a church, a school, possibly a theatre, but almost invariably a press.'

Park understands the ethnical press not only as mediation of information, which follows a one-way sender recipient relationship, but also as a communicative social institution that is shaped by social processes (many immigrants in Chicago in the 1920s were not English literate and thus relied in media in their mother tongue) and broaches specific social

problems that are not discussed in the mass media. Comparable to the Internet in our modern information society, ethnical press is a resonance to societal processes. Following Park, we regard mediation of information as a social and communicative institution.

An important concept of the more recent migration debate, which perceives the flow of information as central to modern migration patterns, is the notion of 'transnationalism' (Portes et al., 1999). The term expresses the creation of new social spaces that are created by 'commuting' between two or more countries, and beyond that also by the personal and social anchoring of a person in different countries and cultural environments (Castels & Miller, 2003³; Parnreiter, 2000; Portes et al., 1999). One aspect of this concerns the creation of an own identity that is not bound to a single geographical place. Some have claimed that the resulting migration patterns are influenced by innovations in the field of ICT (Portes et al., 1999). By using the Internet it is not only possible to communicate 'seamlessly' and inexpensively with relatives and friends in the home country, but also to access a variety of information as never before – independent from one's present location. However, this does not imply that the territorial unit loses its meaning and relevance. David Jacobson (2002) argues that the relevance of a specific place for personal identity does not disappear in transnational multicultural societies. The place of birth or even the home country of the parents can create a strong emotional bond that often is of tremendous personal relevance.

This emotional binding to a common home country can serve as a linking element for making strangers in a new country become willing to support each other. Between them an emotional tie to a specific geographical and/or cultural origin exists. In this case the Internet links persons whose commonness is based on a physical place. The morphology of this kind of networking is expressed either through physical contacts in the sense of social events and face-to-face interaction (Burell & Anderson, 2008), through virtual groups (cf. Hiller & Franz, 2004; Kissau & Hunger, 2008; Greschke, 2009), or through a mixture of both.

Migration and online sociality

Decreasing rates for overseas telephone calls since the 1980s have eased communication between immigrants and their social ties in the home country. Today, synchronous communication is much less limited to scarce visits and the odd, expensive phone call, but is being used much more extensively to support continuous relationships across great physical distances. In this sense the rise of the Internet and its increasingly ubiquitous availability represent a development of great importance. For many migrants, use of the Internet has prevented their home country from becoming a fading memory; instead, frequent mediated contacts with the home country mean that it remains an intimate part of the personal life of the migrant.

We can observe that individual usage patterns of the Internet, for example with regard to different online applications, change according to the migration phase a person is currently in. Hiller and Franz (2004) distinguish between pre, post- and settled migrants, whose functional deployment of search engines, e-mail, forums and chat differs according to the current stage of their migration.

With regard to the social capital immigrants possess or seek to acquire, three different kinds of social links can be distinguished: New ties, old ties and lost ties. These are of differing meaning depending on the stage or phase of the migration. Use of the Internet can be expected to have an impact on the ability of immigrants to build and/or maintain such ties (Hiller & Franz, 2004, p. 743).

New ties refer to new relationships which are established at the destination, even before the actual move is being made. These ties can be very instrumental as they affect the decision of moving and mechanisms that help a migrant to adapt to the new environment. Pre-migrants, for instance, need help with finding a flat or job, post-migrants try to integrate themselves into a new community through new ties, and settled migrants tend to seek people with the same cultural background.

Old ties are an important element for maintaining the personal identity; they can increasingly be maintained by using online communication tools. The maintenance of old ties is still relatively easy for post-migrants, whereas settled migrants might find this more difficult. Regarding social capital these ties can become more important again when migrants consider moving back to their home country.

Lost ties are contacts who are not in touch anymore due to the migration movement. Retrieving persons from their home country is of enormous emotional meaning especially for settled migrants, as it lets them rediscover their own identity. Thereby the Internet opens possibilities that didn't exist decades ago. Search engines and posts in forums can be used for finding people from the old home country or with a similar biography and get in touch with them.

Hiller and Franz (2004) make use of the categories discussed above for a study about a Canadian online community in Newfoundland. The people involved created a group exclusively in the virtual domain, on the Internet, around a shared identity based on a territorial unit (2004, p. 748). The study concludes that the online community allowed members to access social resources which would not have been open to them without the use of a computer. Hence the participation in this online community was a means to increase social capital, which resulted in advantages experienced also in the offline domain (2004, p. 749).

Whereas Hiller and Franz are referring to a closed community in order to better understand internal communication processes, Burrell and Anderson (2008) investigate how migrants are using the Internet for broadening their 'social horizon'. They are pointing out that research approaches which focus on a specific community are neglecting the large majority of migrants, and hence tend to oversee the level of heterogeneity of perspectives which is evident among migrants even from the same country (2008, p. 205). The authors demonstrated this through their ethnographic study about Ghanaians living in London. The Internet is used by young Ghanaians to look beyond their primary social and cultural environment and to access a diversity of media which allows them to develop a more realistic idea of potential destination countries (2008, p. 216). This can support the wish to migrate by providing detailed information about distant places, but also by allowing individuals to get in contact with persons in different countries despite of physical and cultural remoteness. Interviewees pointed out that it was especially the personal contact to strangers in the sense of e.g. penpalships via e-mail or instant messaging that they found fascinating about the Internet. Nevertheless, these relationships were not considered an end in themselves, but were explicitly entered into with the ulterior motive of getting support for finding a job or even for starting a business in the host country (2008, p. 218).

Patterns of Internet usage by migrants

Against the research findings discussed in the previous section, it stands to reason that Internet usage of migrants can be understood in terms of its individual functionality. Hence, research needs to focus on how and for what migrants use the Internet. Kissau (2008), in her dissertation about the integrative potential of the Internet (investigated using the example of Jewish immigrants from the former Soviet Union in Germany), reports that accessing information which is tailored to their current interests plays a crucial role for migrants. She found that immigrants paid interest to online information on both German and Russian matters. At this point the Internet appears to play a socialising function (2008, p. 180).

This finding is confirmed by a representative survey study carried out in Germany on 'Migrants and Media 2007' (ARD and ZDF, 2007): The survey found that the websites most frequently used by migrants are in German language. According to the study migrants spend 10 per cent of their online time with communicative applications such as chat and forums.

A study from Kissau (2008) presents a different picture. About 70 per cent of her interviewees perceived the maintenance of contacts to people in the home country as the

most important feature of Internet usage. Accordingly online communication happens mostly in Russian. Kissau concludes that the preference for intra-ethnic contacts reflects a desire for security and social affiliation. In this sense, online communication can be very useful for coping with migration-related stress and problems in the host country (2008, p. 181). However, it is remarkable that 40 per cent of the users of the study stated that they made new friends through the Internet. Furthermore, users who chatted on a regular basis believed that doing so had supported their understanding of different cultures.

Migrants are indeed a very heterogeneous group, as becomes clear when comparing usage patterns between German residents who recently immigrated from Russia and Turkey, respectively. Kissau and Hunger (2008) found that only 34 per cent of the regular and more frequent online communication of Russian migrants in their study is with Germans or Austrians without a migrational background, whereas Turkish immigrants communicate much more often with Germans (66 per cent) (2008, p. 9). On the basis of an analysis of websites that explicitly address migrants coming from a Turkish or Russian background, respectively, the study found that these do not only differ concerning the language used on the website, but also regarding the kind of information that is presented. In order to categorise these patterns Kissau and Hunger propose a differentiation between transnational online communities, virtual Diasporas and public online spheres (2008, p. 10).

The last kind of social Internet applications can function as assistance for social participation and civil engagement. Apart from their role in helping to maintain a sense of belonging and their role in helping seek job opportunities, online applications of this kind also have a socialising role (Cachia et al., 2007). With regard to the notion of social capital as discussed in the present paper, the sense of belonging and integration within in the host country can build a cultural bridge between two societal groups. Cachia et al. (2007) emphasize that the development on self-initiated migrant online communities does not necessarily lead to social participation, but can also cause the opposite: indeed, they can enhance or at least enable social isolation. This again reminds us that we need to distinguish clearly between the *potential* of Internet applications and the *actual patterns* of Internet usage by migrants. Moreover, negative aspects such as risks concerning privacy have to be taken into account.

These studies show that patterns and impacts of media-related use of the Internet heavily depend on the context. Research has to put the spotlight on individual users and, in particular, their specific usage backgrounds and contexts in order to understand how migrants' use of the Internet affects their social capital, and vice versa. The creative handling with which the actors embrace the medium leads to a constant development and a continuously changing morphology of such. Greschke (2009) derives from the findings of her research on an online platform for migrants from Paraguay and their relatives the (generalising) thesis that migrants and their specific use of communication technologies are predestined for bringing up new forms of sociality (2009, p. 254). She follows that, regarding the question of how globalisation is unfolding in everyday life of individuals and how it is being enhanced and formed by the actors, migration-experienced media users can be understood as a sort of 'vanguard'.

The examples discussed above demonstrate that the Internet enables people – at different stages and in different contexts of the migration process – to join groups and access social resources that can be of very different nature. The Internet makes it easier for migrants to join various groups for a variety of specific purposes, which also means that it enables people to engage in a set of separate communities at the same time. The term 'Networked Individualism' (Wellman, 2002) seems to be of help to understand these kind of disperse networks. Depending on the individual attitude towards communication and the social context of use, the Internet can support migrants to organise and integrate themselves locally without breaking connections to the home country.

However, if and in which way these networks constitute social capital is not totally clarified. There is no analytical framework that deals with the interrelation between social capital,

migration and information society in an integrated way. Nevertheless, the studies references above suggest that there is an added value of Internet usage that is specific to people engaged in a migration process. This is the background against which we initiated our own empirical investigation.

7.1.4 Methodology

In order to answer the central question of the investigation a qualitative social research methodology was applied. The core part of the analysis was formed by two focus groups consisting of immigrants with different backgrounds. Unlike other studies about similar topics, the groups are not online communities in the first place, but groups of young immigrants who are forming a network of people, whose motives for using the internet and the resulting social benefits are anchored in physical space. This allows observing how people are taking a technology and using different applications for differentiated functional use, depending on their specific needs. The approach stands in line with the application of an individualistic perspective of social capital. Group discussions with the whole group were complemented by in-depth interviews of single members. All interview partners were young immigrants from three New Member States of the EU: Latvia, Lithuania and Bulgaria. Most of them were students who have lived in Germany for at least two years and consider staying here beyond their studies.

The discussions followed a specific sequence of topics. The first part of the conversation dealt with social capital and social networks in general. It was elaborated which resources were experienced as crucial for the migration processes, and through what kinds of social networks these resources are provided. In the second part of the discussion the role of the Internet within the process of 'knitting' or maintaining a personal network was examined. This allowed understanding the Internet as an instrument that enabled individuals to tackle specific barriers during a migration and extend their network for specific purposes. Thus our research focused not so much on the 'backward links' to relatives and friends at home, but on the utility of the Internet as a means to get along in a new spatial environment. This approach ensured that 'real life problems' and virtual communication are not seen as two separated parts, but as interwoven and co-evolutionary.

7.1.5 Findings

Difficulties, networks and resources

The nature and extent of barriers that people face who are in the process of migration depend, on one hand, on the preconditions of the movement and, on the other hand, on the efficiency of already existing social networks at the destination – if there are any. For instance, equipment with financial and human capital, personal motivation and language skills all influence the preconditions of the migration. The most common challenges that occurred during the move and the first phase at the destination were related to language problems, the search for an apartment, and dealing with administrative formalities. Across all interviews we found that language abilities, or impediments, play a central role during the whole process of migration, as they are influencing what strategies a migrant can follow and which resources he or she can access in order to cope with specific barriers.

Basically three different strategies were chosen to cope with such challenges: institutionalised aid, use of financial capital and exploitation of social capital. The first was used, for instance, when a person was allocated a place in a student dormitory by the university administration. The possibility to make use of financial capital was limited in all cases, as the respondents were young adults and came from countries whose average GDP per capita is low. Hence, making use of social networks in order to get along was something very common, and was thus intuitively applied in many different aspects and phases of the migration process of all interviewees.

Social contacts which provided resources that allowed a person to cope with specific problems did not only link immigrants who share the same nationality, but also people from different national backgrounds who simply faced the same situation, i.e. who had immigrated recently. The resources that were accessed through these networks were either direct physical support, for instance to share an apartment, or the transfer of very specific information, for example about jobs opportunities or how to deal with certain administrative forms. The crucial role of language skills as a key resource throughout the whole migration process became obvious again: language capabilities have an influence on the barriers and challenges faced, as well as on the options available for tackling them.

As a social resource language appeared in a twofold manner. On the one hand, a lack of language skills can be compensated for by a well-developed network to other persons of the same ethnicity, given that the contacts are able to communicate sufficiently in the language of the host society. This case is very typical for the early phase after arrival, in which the 'basis' of the stay is laid. Practical resources such as a place to stay or help with formalities are often made accessible by using the language skills of contacts from the personal network.

On the other hand, language is also a resource, which can be made accessible through an ethnical heterogeneous network, which means that language skills are acquired according to current needs. This second case can be understood as being crucial for the emancipation in a new social environment. In this phase often a network is created that comprises people that speak the same language as well as natives of the host country; such contacts are usually a necessity for further integration.

Following a network perspective of social capital, the extension of a personal social network implies that new social capital is created, as the number of people who can be accessed for support and resources is increased (Flap & de Graaf, 1986, p. 146). Hence, it seems fundamentally important to take a look at the strategies that interviewees used to increase the scope of their personal networks at the destination, and in a second step to analyse the role the Internet played within this process.

If we leave aside the Internet for a moment, several strategies to extend a network could be identified, including: using already existing networks; meeting people at the job or at university; engaging in a migrant club or society; or making contacts at informal occasions such as parties. Interestingly, already existing networks were only rarely used to meet new people. Most of the respondents enhanced their social networks through their studies or job. Interviewees also felt that it would be more beneficial for them to broaden the range of contacts they have, as they voiced interest in becoming more integrated in the host society. There was a belief that contacts only among their own nationality would not be sufficient for this purpose.

Our fieldwork experience confirmed that it helps to let the interviewees speak about the social circumstances in which they live in order to better understand the context of their personal Internet use. This helped us to identify the structures of social networks which were perceived as most beneficial by migrants, and also to find out if the Internet is actually able to contribute to the creation and exploitation of social capital.

Earlier in the present paper we already discussed the question whether successful migrants require closed, intimate social networks to people with the same ethnic background, or open, heterogeneous networks that allow bridging 'structural holes' (Burt, 1992) and building relationships to people outside the primary group. Our evidence suggests that it is a combination of both structures that is most useful, and that a phase where intimate ties are most important is typically followed by a phase where heterogeneous networks become much more relevant. This relates to the previous finding that individual needs and ambitions change within different phases of a migration. Granovetter's (1983) conclusion concerning the benefits of weak and strong ties proved to be very helpful in this context. He infers from his empirical studies that weak ties enable a person to access exclusive information and thus generate a competitive advantage, whereas strong ties are more motivated to provide direct,

physical support and are generally easier to mobilise. Our findings confirm his conclusion, if we assume that ties among persons with the same background (same nationality or recently migrated as well) tend to be stronger, compared to connections to people from the host society, which hold exclusive information, but are more difficult to contact, e.g. because of language problems, tend to be weaker.

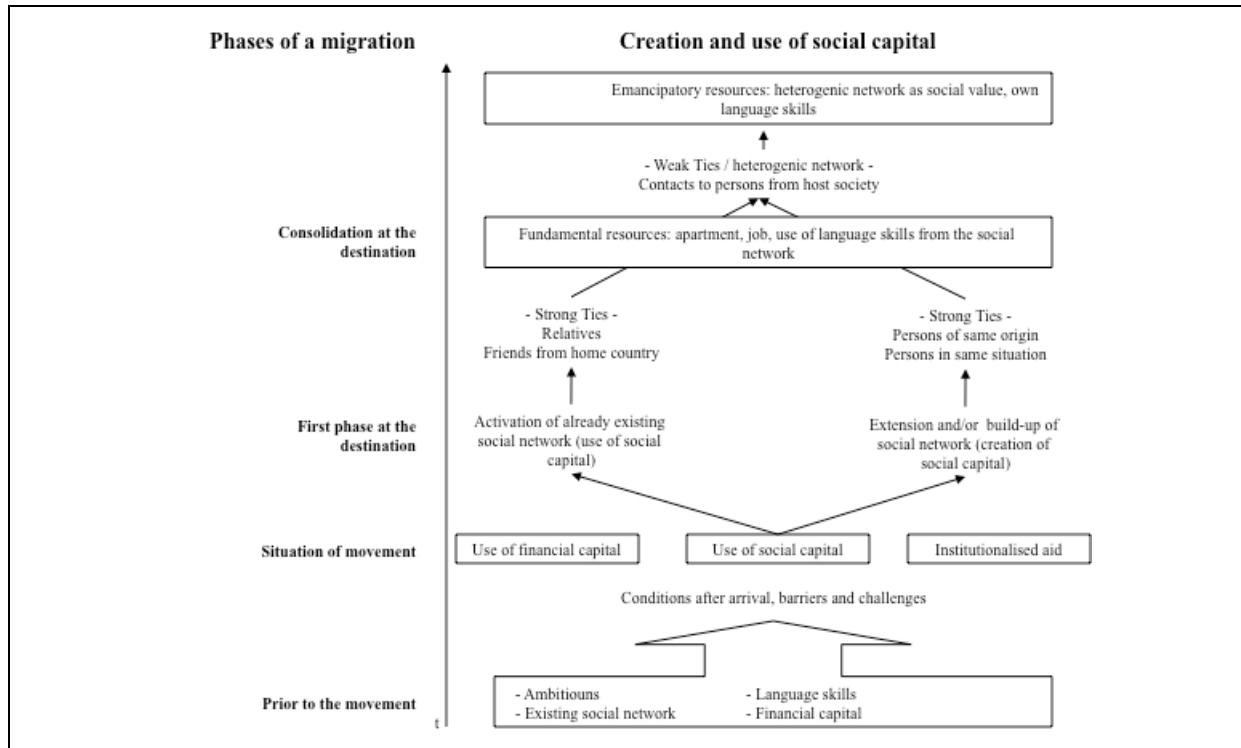
Our analysis indeed showed that fundamental resources, like a place to stay or support concerning formalities, are more likely to be provided by closed networks consisting of strong ties, whereas personal consolidation in the host country is only possible when resources are accessed that require a heterogeneous network consisting (as well) of weak ties. These resources would, for instance, be the acquisition of language skills or, at a later stage, information about employment opportunities which go beyond typical 'migrant jobs'. In this sense we can also understand access to weak ties with people from the host country as 'emancipatory resources'.

Nevertheless, an important detail concerning the benefits of closed networks had to be added to the theoretical assumptions. While we did find that most resources were provided by strong ties, it is important to note that such strong ties are all the more profitable when these are, on their part, able to span 'bridges' to the host society. Spoken very rationalistically, this means that the value or utility of a contact is determined by the extent to which this person occupies a position the migrant cannot take him- or herself. Hence, it is not simply the reliability that makes closed network generate benefits, but also the possibility to get support from somebody who is already better integrated into the host society. The most common reasons why a migrant cannot take this 'bridging' position himself are lack of language skills and lack of knowledge about 'how you do things in this country'. During the interviews it became clear that respondents consciously sought out people who could offer them these benefits, while also being easily accessible and also sympathetic to the migrant's situation. In the words of interviewee Boris:

'I knew that already beforehand, I need to find somebody who is already here for a longer time, because it is pretty hard to do everything on your own. [...] Yes, but that doesn't happen so often. But when you find somebody like that... The guys who already live here for a few years, they know how to do it; with university or how long it takes to find a place to stay. Where are you able to work in the first couple of month? Or such a mini-job like McDonalds or something.'

At this point the functionality of social relations as postulated by Coleman (1991) became very comprehensible.

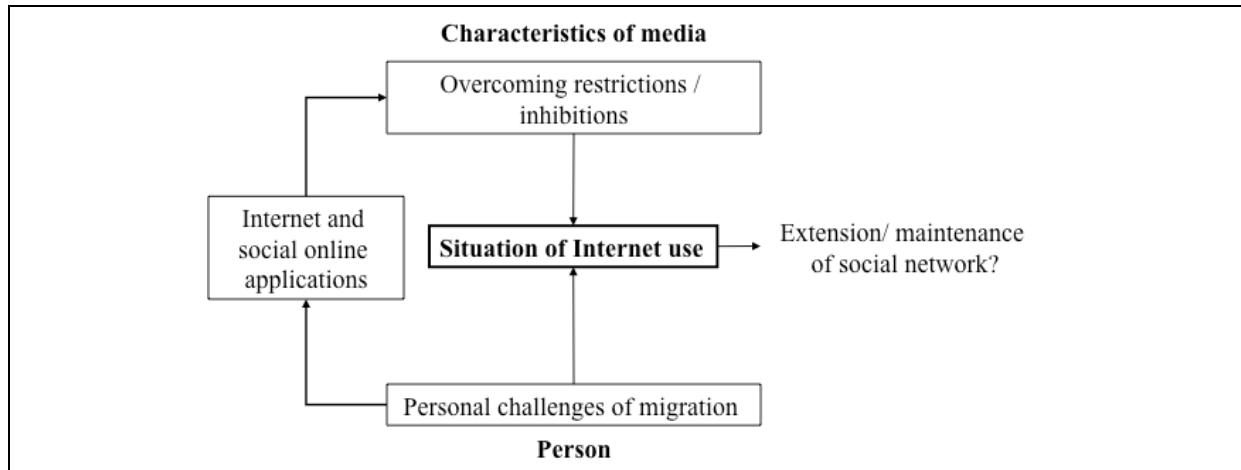
In order to sum up our findings, Figure 18 illustrates the identified challenges , social networks and resources along four different phases of the migration process, beginning with the situation prior to the migration, the situation during the move, the first phase at the destination, and finally the consolidation phase in the host country. We will return to this discussion at the end of the following chapter.

Figure 18: Challenges, social networks and resources of a migration

Source: Stubbe 2009, translated by the authors

The Internet as an amplifier of personal networks

These preparatory explanations again show that an analysis of individual social Internet use must take the specific background and circumstances into account (cf. Döring, 2003², Figure 19). In the subject matter of this investigation it is the special challenges of a cross-border migration which bring about specific patterns of Internet usage, at least in so far as migration specific Internet use is concerned (respondents' more general Internet usage patterns were not subject of the study). The interviews showed clearly that there indeed is a migration-specific Internet use the patterns of which result from the specific challenges an individual migrant faces. The Internet and its social online applications were perceived as a tool which enable fresh immigrants to overcome restrictions and inhibitions of face-to-face communication in the host country. The extent to which migrants found it possible to overcome problems depended highly on the individual communication behaviour and the person's general attitude towards online communication. Our interviewees appeared highly motivated to use the Internet for the extension of their personal social networks at the destination, and they understood the Internet as a means for adapting to a radically new life situation.

Figure 19 Interpretation of the media-ecological framework by Döring (2003²)

Source: Stubbe 2009, translated by the authors; based on Döring 2003²

The most common applications for doing so were e-mail, social networks (technological, e.g. Facebook or StudiVZ), online communities, VoIP, instant messaging and forums. Against our expectations, the share of respondents who reported that they actually met somebody face-to-face whom they initially got to know online was relatively high (cf. Dutton & Helsper, 2007). Six of eighteen interviewees stated that they met somebody (in the context of their migration) where the first contact had been made online. But nevertheless, the most common deployment of Internet communication for the extension of a social network was for consolidating contacts with people they had only fleetingly known before, but still had first met in physical space.

Overcoming restrictions and inhibitions

In doing so, the respondents stated that overcoming personal inhibitions of face-to-face communication was a main advantage of using the Internet. This became important, for example, when somebody felt unsure about how to interpret casual conversation with persons he or she only briefly knew. Some said it simply felt easier and less importunate to write a message instead of calling somebody you only briefly know. For instance, Ilze stated that she felt so in the first phase after arrival:

'Of course, persons, who I don't know so well, I can't call them directly and say 'Hi, what are you doing tonight?' It's easier for me to write them a message and ask if they have plans for the weekend or so.'

Another restriction of face-to-face meeting that can be overcome by using the Internet is the demand for physical and temporal co-presence, which is certainly an advantage that is very much appreciated by migrants. But overcoming this restriction does not only pay off regarding the communication with the home country, but also in the time before the movement, when the migration is planned and important contacts are in the destination country. However, the investigation showed that the advantages of online communication do not immediately change the type of contacts, compared to offline-strategies of extending the personal network that were discussed in the first part of the analysis.

Amplification of new networks

The term 'amplification of new networks' refers to the extension and consolidation of new personal social networks at the destination by using the Internet. The 'nature' of these networks, in the sense of the type of persons contacted, does not necessarily have to be another than by physical strategies to meet new people. Online applications were basically used as a tool to either (1) contact new people whereby the first step was made online and a

later physical meeting took place, or (2) 'manage' communication with new contacts who did not emerge from online communication, but from other occasions. This chapter deals with relationships that are *not* exclusive to either the virtual or the physical domain.

For most respondents the distinction between online communication and any other technology-based communication was not particularly notable. In everyday life boundaries between different communication channels are blurring. For our empirical work this had the side effect that it was often difficult for the respondents to clearly differentiate between contacts for which online communications plays an important role and those relationships in which the Internet is no significant element of communication. However, by digging a little deeper six cases could be identified where the first step of contact was made online. Compared to numbers from the survey "The Internet in Britain" (Dutton & Helsper, 2007, p. 57), which discovered that twelve per cent of all Internet users have already met somebody face-to-face whom they got to know on the Internet, our finding suggests that making new friends online is more common among young, well-educated immigrants.

Interviewee Ilze, for instance, used an online social network in the first phase after her arrival, and also earlier when preparing her move, in order to search specifically for people who are in the same situation as she is. This included persons who had recently migrated, and some who have already settled down in the host country:

'That was at the beginning. Back then I have searched for people in Cologne, who might be able to help me. [...] Because I thought they might know the situation that you are a stranger in a big city, and, yes, they might help me with some helpful advices or contacts.'

She was quite surprised that a high share of her messages led to a very active dialogue, in which the contact persons often appeared to be very motivated to help. Finally some of the contacts were continued in physical space:

'There [in the social network (tech.)] I also discovered the Latvian pub meeting in Cologne. Then we founded a [online] group 'Latvians in Cologne' and also other events like the "Baltoween" or the Latvian independence celebration in Münster.'

Ilzes statement shows how much online communication corresponds with traditional strategies to meet new people, as introduced earlier. Consciously she was searching for certain kinds of persons as she was expecting them to be of most help for her to gain ground in the new environment.

Interviewee Nikolai took a comparable approach when he contacted a migrant club via e-mail before he came to Germany and later became a member of such. Jovana did so as well and was looking for a migrant club in her area through which she might get to know new people:

'I just searched with Google. Maybe I find something, if not in Cologne then maybe close to it. That's how I found Buditeli. I had a look at their website and the pictures on there, and I was interested. I immediately tried to contact them and wrote the members an e-Mail. I was very enthusiastic.'

Both answers showed that online contacts might lead to continuous relationships. Nikolai became a very active member of the club and participates in all activities; Jovana only recently joined a club but has met her closest friends in an online forum five years ago.

Nevertheless, contacts where the first step was made online remained the exception during the conversations. It appears way more common that online applications are used for the 'management' of already existing contacts. This was the case if somebody new was met face-to-face but the regular communication was transferred to online social networks, e-mail including mailing lists or forums in order to arrange activities and events. In these cases, the Internet was used basically as an additional communication channel that supports the consolidation of new contacts.

For interviewee Yelina the receipt of an e-mail proved to be of great help in the first after arrival to extend her personal network, which previously had been relatively small:

'I have met somebody. He signed me in on this mailing list. Through this I heard about a trip to Brussels and to the German parliament.'

In the following course of the interview she reported that she was able to extend her circle of friends on these trips. Janika acted in a comparable way and signed in to a community in order to arrange meetings for doing sports with people she only briefly knew beforehand. Same as Ilze, who used a social network (tech.) to communicate with her previously only sporadic contacts more often. She thought of the Internet as a very helpful tool that allowed her to write a less binding message instead of calling somebody she only briefly knew.

All of these contacts are highly connected to the new physical and social environment in which the migrants try to establish themselves. This means that a high share of Internet communication is in fact related to physical interaction in a given space, which here means the new physical environment in the host country. Boris answers, when asked how high the share of his online communication is that regards local arrangements, very drastically:

'In the last two years one hundred per cent. Since I live hear all new friendships or relationships I started are somewhere here in Cologne. All my friends are now from Cologne. Everybody I know now has something to do with Cologne.'

While Boris' statement cannot be generalised – in other cases, connections to the home country are a central element of migration-specific Internet usage – his quote shows that online communication is closely linked to social processes at the destination. Boris became friends with somebody in Cologne and their interaction refers to Cologne as well; both pictures in his personal usage pattern.

In both cases – regarding relationships where the first step was made online and the ‘management’ of new contacts that already existed – the function of the Internet is mainly instrumental. The respondents embraced the technology and applied these to satisfy their personal needs. The already identified restrictions and inhibitions of face-to-face communication, which often can be overcome by using the Internet, reappeared within the statements concerning the amplification of new networks. It became understandable that co-presence as well as inhibitions regarding the management of new contacts can be overcome as well as the variation of communication channels may prove to be helpful for the extension and consolidation of a new network.

In most cases it showed that the type of contact is the same as in situation without the Internet. In both cases it is the collective situation that a) makes contacting seem sensible and b) makes it easier. Hence, it is not another category of ‘ties’ that connect over the Internet. The scheme presented in Figure 18 also applies to Internet-enhanced migration processes. What can be said is that the social structures that were discovered in the first part of the analyses could be extended and/or consolidated and thus were amplified.

Enhancement of social capital

In order to distinguish the creation, usage and maintenance of social capital from a forth kind of online social interaction that leads to support, it seems appropriate to also speak of an enhancement of social capital through the Internet. An enhancement of social capital took place through the possibility to exchange experiences with other migrants via online forums and the like. Hereby it was often very specific information that were passed on and which could sometimes be accessed already prior to the move.

Interviewee Jegor, for instance, had a very specific question concerning an administrative document prior to his movement. As he knew nobody in Germany, he posed a question to an online community of Russian migrants living in Germany:

'That is actually only a platform, it's called germany.ru. That is a website about Germany for Russians. Mostly it is used by Russians, who live in Germany [...]. When I considered going to Germany I found out about it and posed a couple of questions, which had also been answered.'

In fact it was about how I can accredit a document the easiest way, so it is notarially certified in Germany.'

This shows the parallel of online communication and the strategies to overcome barriers of the migration process, which were already introduced above. For Jegor it made sense to consult a person that has already experienced the same problem. As he did not dispose of a social network in Germany, it appealed to him to use the Internet for collecting this piece of information. In this case it was not only communication in the traditional sender-receiver mode, but a social interaction. Assumable it is a form of solidarity on the side of the responding person, who wants to help a 'latecomer'. This speculation is justified as Jegor consciously approaches a person, who experienced the same situation as him. If he had posed the question directly to a notary he probably would have had to pay for the information.

Especially within the focus groups this topic was discussed regarding the websites of migrant clubs. Participants in both groups were members of migrant clubs that used their own website for special announcements and contact point. These websites include forums as well as the possibility to subscribe to the club's newsletter. Additionally groups in online social networks were set up. In this way members of the club are kept up-to-date as well as potential newcomers are reached.

The meaning of these services became comprehensible through the statements of some active club members. Danilo, who is chairman of a migrant club, told us:

'Sometimes there are e-mails from new students for example, who want to know everything about their studies; searching for an apartment, searching for a job and so on. Regularly at the beginning of the semester there are these kind of questions. We answer these and give short introductions. That is all over the Internet.'

Lukas was able to give very specific support in this manner to somebody who approached the club via its website:

'I helped him to find a place in a dormitory. Concerning the university place he already managed everything from Latvia. I lived in a dormitory myself back then and introduced him a little, gave him a little support. Like that he had a place pretty quickly.'

The parallel to the resources listed above becomes very clear at this point. From the perspective of the supplicant, Lukas is somebody who is very easy to contact as both dispose of very obvious similarities, the same origin. The fundamental resource that shall be accessed is a place to live, for which people in the same situation can provide very efficient support. The Internet formed the bridge over which all necessary information could be exchanged.

Compared to other forms of social capital, the only resource provided by these virtual networks is information – physical support was never the attention of the respondents. Thus it cannot be spoken of a substitution of other forms of social capital but rather of an enhancement. The purpose of the interaction is filling a gap with the help of online communication his personal network could not close. In this context, some scholars have used the expression of 'sociotechnical capital', i.e. 'productive resources that inhere in patterns of [impersonal] social relations that are maintained with the support of ICTs' (Resnick, 2005). This comprises automatic taste matching, recommender and reputation systems which are being applied not only for commercial purposes (cf. eBay, Amazon), but also for helping users identify relevant information and find help for specific requests. It remains open to debate, however, whether reference to the term 'social capital' is justified here.

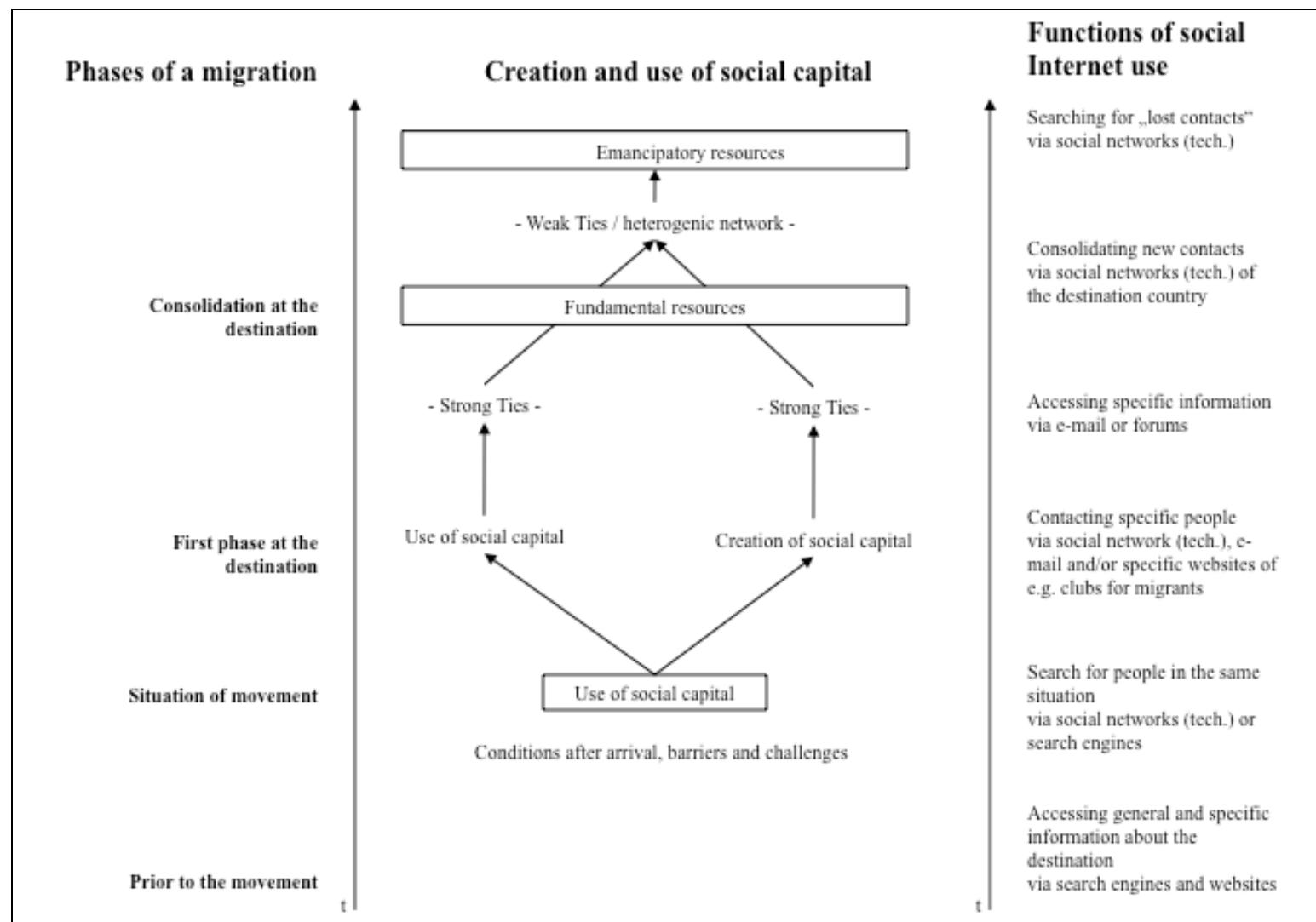
Within the personal conversations with the interview partners it showed that it is not appropriate to focus only in instrumental actions, when it comes to the relation of social capital and Internet usage. Lin (2001b, p. 6-7, p. 19) states that also expressive actions generate social capital as they can strengthen social identity and personal well-being. In terms of Internet usage this was observable within the communication with relatives and

friends in the home country. It turned out that the Internet can indeed be used as a means to preserve a personal identity by keeping in contact with friends at home despite the spatial distance. Respondents stated that it is a clear advantage of the internet that it is possible to exchange photos, so it is possible to keep up with things happening in the other person's life. This is a big help to prevent that friends estrange through the movement, which is a very common fear among people who go back to their home country for holidays or alike.

Opposite to findings from studies dealing with the meaning of websites 'from migrants for migrants' (cf. Hunger & Kissau, 2008), it could not be approved that these play a major role for the respondents. Aspects of identity could rather be found in the usage of common applications, for example social networks (tech.) as Facebook. These enabled migrants to search for old friends as well as maintain relationships to new contacts. This is a way to conserve a very personal piece of the home country in the personal everyday routine (cf. Hiller & Franz, 2004).

As a last step of the analysis the identified migration-specific actions that were enabled or supported by the Internet were matched to different phases of the migration process.

The results were integrated into Figure 20 (see p. 372). This shows that individual patterns of social Internet use change along the personal development at the destination and respectively support these. Prior to the movement the Internet was used to access general information for planning the trip as well as already getting in touch with people who have already moved (cf. Burrell & Anderson, 2008). In the first phase after arrival the extension of the personal social network took place, for which the Internet was a very helpful means. After a consolidation in the new society has taken place social Internet applications are mainly used for maintaining relationships to personal contacts in the home country.

Figure 20: Functional use of the Internet in different phases of a migration

Source: Stubbe 2009, translated by the authors)

7.1.6 Conclusions and outlook

Concerning the relation of social capital and Internet usage the results basically verify the outcomes of other, often larger studies (cf. Boase, J. et al., 2006; Dutton & Helsper, 2007; Katz & Rice, 2002; Kavanaugh et al., 2003; Nurmela, 2006; Wellman et al., 2001). The sample also showed forms of amplification, maintenance and enhancement of social capital. For young migrants the Internet receives the role of an instrument which often supports the creation and usage of social capital. Regarding creation of social capital, the role is comparable to an amplifier that supports the extension of new social networks and may help to consolidate such. For the usage of social capital the relevance of the Internet is less central. It might be used by migrants to collect important information through already existing contacts, but the structural impact on these networks is rather low. Nevertheless, it is not only the building and usage of social capital that is affected by the social use of the Internet. Additionally it is possible to complement social capital by using specific, social Internet applications. With these virtual networks information gaps are closed, especially prior to the movement, and thus serve as a kind of social capital.

In the introduction we mentioned that there are political connecting points for this analysis regarding the objectives of the Riga Conference 2006, in which the European Commission called to increase cultural diversity in the digital space and to support the economic and social inclusion of immigrants within the information society. Nevertheless, a transfer of the findings of this analysis onto the context of the Riga objectives is rather difficult. On the one hand, the findings are only valid within their defined system (Kleining, 1982) and, on the other hand, it was methodologically determined that the analysis is not about the digital space at large, but about instrumental behaviour supported by the Internet. Hence, only statements regarding the second objective (as mentioned above) are possible.

It was shown that people make use of Internet application in many different ways – as far as they possess the necessary ‘e-Skills’, which was given prior in the case of this sample. Although there were not many cases of ad hoc links ‘into’ the host society via the Internet, what would have been the most desirable out of a political perspective, it still can be said that aspects of consolidation in a new society were touched. After all there were also contacts to German people maintained by social networks (tech.) or alike. If these impacts of Internet applications can be directed or supported by political instruments can’t be commented.

However, it became apparent that Internet services play a great role in the phase prior to the migration movement in order to prepare the migration – these for instance can be supported by public authorities. Many times within the interviews it showed that the first step in order to gather information about the destination or to plan the first days and weeks, was taken over the Internet. Thereby especially services from universities and public bodies as well as websites for apartment adds play a very supportive role. In order to support the inner European migration these websites should always be available in English, too.

Furthermore, interactive websites, where ‘Pre-Migrants’ are able to pose questions and have the possibility for an exchange with already socially integrated migrants, can ensure that very specific information are passed on. If it would be the case that such services are moderated and offered from the public side, they can also function as a bridge ‘into’ the new society. Such a moderated solution could also prevent form the threat of social isolation through ethnical online communities as mentioned by Cachia et al. (2007).

In general the research field of Internet use by migrants is not yet very mature. Especially within migration theory only very few works can be found about this topic. However, it should be especially this field that should integrate the impacts of information technologies into already existing models and empirical practice. This is important because virtual space should not be treated as separated from other social phenomena, but as a communicative social institution that is shaped by social processes (cf. Park, 1971, [1922]).

Research should not stop at describing usage patterns. This would result in (1) that many backlashes on the migration processes remain undetected and (2) that many migrants remain unconsidered, as they are not interested in websites that are specifically run for migrants. The analysis showed that it's not necessarily special online applications for migrants that have an impact on the migration process, but the creative handling of different communication channels. For a better understanding of these actions a stronger emphasis has to be put on the individual situation of usage, which is a result of the social context, the personal communication habit and which medium is chosen and the related implications.

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[G] Creation and distributed innovation

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0 Executive Summary

Purpose and scope of domain report

The Internet and mobile networks offer unprecedented possibilities for average users to widely distribute content they have created. Manuel Castells argued in 2001 that “the most important latent demand [is] for interactive free expression and autonomous creation – nowadays largely stymied by the sclerotic vision of the traditional media industry.” Examples include “open source, free posting, decentralised broadcasting, serendipitous interaction, purpose-oriented communication, and shared creation”.

Epochal trends

Creative expression and distributed innovation covers a huge range of human activity. Music, art, drama, dance, creative writing, film, crafts, hobbies, play, and various forms of social engagement all allow people to express their creative urges. In many ways, this domain is one of the easier to imagine how it would have developed without ICT since to a large extent, there has been remarkably little encroachment of ICTs into many areas of this domain. There is an active literature on creativity and creative expression, but relatively little of that work has focused on how creative expression has seen the impacts of ICTs.

Following Cliche et al. (2002), artistic creativity can be seen less an individual character trait, and more in terms of what they call “collective stocks of intangible assets” that are accrue both individually and as part of broader ‘creative milieus’. If this is the case, **strengthening networks of creative people and creativity-oriented organizations through cultural and creative policies can result in self-reinforcing growth that nurses creativity, manages economic and legal provisions, and intervenes in markets to promote supply and expand demand of the outputs of creative expression.**

Creative classes

Much of the work on creative classes in Europe, particularly from Florida and Tinagli, has a technology aspect to it, but is not necessarily solely focused on ICTs. From this perspective, creativity is one of the driving forces of economic growth in the new economy, and the creative classes who are driving this growth are drawn to locations with openness, diversity, and cultural creativity expressed in abundance. Using their definition of creativity, in half of the European countries they studied, over 25% of that country’s workforce were part of the Creative Class. One could argue that this trend toward living in cities with high cultural capital predates the ICT expansion of the last 15 years, but that it has been accelerated by the technology-focused industries that place a high premium on creativity.

Re-configuring access to the arts

One hope for ICTs is that by lowering barriers to participation in the arts, **arts communities will be able to reverse long-standing epochal trends toward reduced funding and participation in certain types of arts.** Creative expression takes a wide variety of forms, from street rap to opera, and no single trend applies to all. So, lovers of classical music and opera may bemoan the increasing difficulty in attracting audiences and securing operating funds, while pop singers and rap artists have many new outlets for reaching audiences and selling music once they are able to bypass the gatekeepers of major record labels. In both of these examples, however, we are seeing a reconfiguration of access both for creative producers, and for the consumers of creative expression. And, as is explained in more detail elsewhere in this report, the **boundaries between producers and consumers is getting**

more and more blurry, to the extent that the division between the two does not even make sense in some subdomains where everyone is both a producer and a consumer of creative content.

Non-adopters of technology

Not all subdomains of creativity have embraced ICTs. In some cases, there has been active resistance to incorporating ICTs into particular forms of creative expression, such as the resistance by musicians and musicians' unions to allowing pre-recorded and semi-automated musical backing tracks to things such as West End and Broadway shows. In this case, the technology was seen to be designed as a means of reducing labour costs (and opportunities for musicians) at the expense of the quality of the music.

In some other subdomains, there has been relatively low adoption because of a lack of clear applications, such as in classical music, opera, or dance. However, even in these domains where most performance is of the traditional variety, there are instances of ICT engagement, such as the YouTube orchestra project where performers auditioned via YouTube, or dance performances that incorporate dances in different locations sharing the same virtual space via computer and video links.

Applications of ICTs in creativity

Supplementing existing forms of creativity

Many of the applications of ICTs supplement, rather than replace, existing forms of creativity. Digital photography has allowed for new ways of creating images and sharing them with others, MySpace has allowed for musicians to reach new audiences, and writers and 'zine publishers are able to reach larger audiences via blogs, forums, wikis and webpages.

Novel forms of creativity

Other forms of creativity enabled by ICTs are arguably novel, rather than supplementary. Prior to sites such as YouTube becoming available, re-mixing videos and music was the domain of a few professionals with access to expensive, professional equipment. Now, any school child with inexpensive gear can create video, and can do so in ways that break out of the traditional patterns.

Lowering of barriers

Recent years have seen a big jump in creativity online. Recent 2009 OxiS survey shows that 44% of UK Internet users post pictures online, which is over double the percentage (18%) who did so in 2005. Many of the Web 2.0 applications, such as YouTube, Flickr, MySpace, and many more, have brought new levels of usability to their products. This, in turn, allows people who wish to create content to do so quickly and easily, without spending huge amounts of time simply learning how to use the complex hardware and software that dominated the computer industry until relatively recently. While the average citizen does not have access to an expensive video editing suite, many have access to simple tools that allow for video editing that 20 years ago would have required professional quality equipment.

Interactivity

One of the hallmarks of new forms of creativity is interactivity. Not only can users create, but they can comment on each other's creations. Using Creative Commons licensed material, they can re-use and re-mix other work into new creative forms. With online forums, they can meet like-minded people and share tools, techniques, ideas, and enthusiasm for their creative work. Prior to the Internet, these sorts of sharing were primarily limited to

people lucky enough to live near others who shared their interests. With the Internet, however, even niche interests can be shared among a critical mass of people distributed among a large geographic area, or even distributed globally.

Globalisation

While some have argued that the Internet is the death of distance, there is also countervailing evidence that considerable creative expression still takes place within certain geographic and cultural communities. One reason for this is language, which tends to limit the pages that a potential viewer can understand even if some content on the page, such as images or music, may not require language itself. Also, preferences for certain sharing sites varies by country and region of the world, which results in de-facto geographical divisions.

Nevertheless, the open nature of the Internet itself allows for at least the possibility of broader distribution of creative content without regard to national borders and language barriers, and in some cases this is being realised.

The rise of the prosumer

The blurring boundary between the consumer and the producer has been mentioned several times, but it deserves special mention here. As the barriers to producing content have dropped, more people are able to produce content. Some of this content will be made at a very high level of quality, and may allow the producer to generate income from it. At the other end of the scale, professional producers of content are finding that in some cases their traditional markets are drying up as the wide available of freely available content has reduced the willingness of the market to pay a premium for their professional work. The boundary between these two formerly distinct groups will continue to blur as technology improves.

Social Impacts of ICTs

From these trends and the applications of ICT in consumption, the report has identified several main social impacts. As with other domains, many of the changes in patterns of creativity as a result of ICT involvement have been evolutionary rather than revolutionary.

Rationalisation

Rationalization has played less of a role in the area of creativity and distributed innovation than in other domains where efficiency is considered a key criteria. The main issue with regard to rationalisation has to do with the concept of innovation and the relationship between innovation in the creative domain and other forms of innovation.

One main area of interest is the blurring of the amateur – professional boundary. In a number of the subdomains identified in this report, there have been shifts, tensions and changing relationships between professional and amateur producers of creative content. The extent to which this has allowed amateurs to professionalize their output, and possibly to begin to earn income from their creative activity as a result, has also been shown to potentially threaten the ability of existing professional outlets to continue to earn income from their activities. The report emphasizes explicitly that it would be misleading to assume user creations are amateurish per se. Actually, the popular so-called Web 2.0 applications can be seen as “infrastructures for whatever” which lower the bar to user participation by providing even more simple and easier to use interfaces as those serving the exactly same activities before the advent of YouTube, MySpace, Facebook, Blogger etc.

Networking and social capital

When considering the extent to which the creative domain is already networked, the answer is highly variable. However, for those subdomains that are increasingly networked (music, photography, writing and information sharing, video), we have already seen major changes in the organizational structures supporting the subdomain.

For at least some portions of this domain, one could argue that a critical mass of online connectivity has already been reached. This domain is quite interesting, however, because even though it is involved with creating outputs, in terms of technology itself it is largely a consumer of off-the-shelf applications bent towards particular creative uses. Relatively little software or network infrastructure has been built specifically to support this domain, but there are numerous examples of existing software and network infrastructure being tweaked, repurposed, and enrolled into new uses. This re-purposing, of course, is itself a form of creativity.

The issue of social capital is clearly demonstrated in this domain, although many participants would likely have difficulty with the notion that expressing creativity is necessarily increasing their social capital. This is due in part to the fact that most personal payoffs from the expression of creativity are indirect. Unlike domains where high social capital can be translated into making money or finding treatments for disease, having a popular blog that is written for free and given away for free has fewer concrete rewards.

The ties that predominate in this domain are likely those representing bridging capital, building weak ties of similar but distant people. A shared interest in a band, an author, or a style of photography are not the strong ties that create bonds that can be relied upon in different settings, but ICTs do allow people with these shared interests to connect in ways that would not have been possible otherwise.

Empowerment and Participation

Recent developments of Web 2.0 applications on the Internet have greatly enhanced the ability of citizens of Europe and elsewhere to participate in the creation of content and ideas for public consumption and discussion. This has been somewhat of a surprise, particularly in light of some arguments in the late 1990s that came out of the digital divide debate. In short, it was suggested that even if countries were able to lessen the digital divide in terms of access to technology, there would still be a strong divide between those who had the skills and resources needed to create content and those who remained passive consumers. Barriers to creating content were relatively high at the time: designing a web page required knowledge of HTML coding and access to hosting services, and bandwidth was relatively expensive so a popular site could quickly become unaffordable. Web 2.0 services, on the other hand, allow users to create blogs, photo sharing pages, music sites, and any number of other complex contributions to the Web with no knowledge of obscure technical codes. As a result, we have seen participation in the creation of content growing rapidly.

Information and Lifelong Learning

Learning in the creativity domain is largely informal, and the result of either self-teaching or peer-to-peer support. This theme of informality is also one of the elements of this domain that make it particularly potentially valuable for engagement of adults in lifelong learning. Within the creativity domain, the sharp divisions between amateurs and professionals are blurring, which in turn allows for serious amateurs with aspirations to be able to contribute to the growth in user-generated creative output.

Policy implications

The domain report gives several policy implications:

Lowering Barriers

- There is a high likelihood that the act of producing creative content will continue to get easier, as the technical barriers to creating output drop further with the creation of new technologies for creating and sharing content.
- We will see additional novel applications and infrastructures spring up to support new kinds of creativity online and offline that are enabled by ICTs.
- Increasing numbers of young people will grow up thinking that generating creative content is a normal activity. This view then will contribute to their being more well-rounded citizens who are also more likely to engage in the consumption of cultural and artistic opportunities throughout their lives.

Blurring boundaries between amateurs and professionals

- There are growing numbers of participants who are engaged in “serious leisure”. Participants who are deeply engaged in an set of activities, belong to a unique ethos and social world, and have a social identity connected to the activities beyond that associated with a casual amateur may be engaged in serious leisure. These activities should be recognized and supported by policy makers.

Users, amateurs, and labour

- Changing understandings of the terms “user”, “amateur” and especially our understanding of labour, which has to be revisited in view of unfolding media practices.
- People are doing activities that have all the signs of labour activities, except for the fact that the participants do not get paid for their work, but may gain other less direct benefits such as increased social standing, an enhanced sense of self-control and self-respect, and thus an increased social efficacy in general.
- This increasing efficacy may later transform into enhanced economic and political capital and power.

Engaging citizens

- Policy regarding creativity must tread a fine line between providing **adequate support** for creativity and cultural institutions, and stepping out of the way of those wishing to engage in creative expression by **lowering barriers** and allowing creativity to flower.
- Arts policy has not by and large addressed the role that ICTs play, or should play, and this oversight should be corrected.
- Many activities of creative expression and innovation on the Internet are still seen as peripheral in terms of development activities, but additional attention in this area has the potential to pay dividends in terms of a more engaged citizenry who feel empowered to express themselves in the public forum of the Internet.

1 Introduction

The Internet and mobile networks offer unprecedented possibilities for average users to widely distribute content they have created. This user-created content appears – in contrast to other uses of the Internet such as information retrieval and one-to-many entertainment – to represent a fundamentally new way for people to interact with public media. In 2004, a Finnish study on the topic came to the conclusion that “the need now is for various kinds of forums where citizens could build up the courage they need to put up their own production on display” (Nurmela, Parjo, & Sirkiä, 2004, p. 8). Since then, the success of Internet services such as MySpace (29 million users in Europe¹), YouTube (where users in the UK, Spain, Germany and France were among the top ten uploaders of content according to one small study²) and Flickr has confirmed that there is considerable interest from users in using the Internet to publish self-created content (Benkler, 2006). For Facebook, which mainly enables social networking, but is also arguably one way people can create content and express a degree of creativity through posting updates and photos to the site, European levels of participation are high: 9 of the top 15 countries in terms of Facebook penetration are in Europe. This includes the top three countries of Iceland (46.9% penetration), Norway (40.3%), and Denmark (38.3%)³. Similar patterns are also present in the empirical data collected on behalf of UK’s national regulator OFCOM in a survey covering the UK, France, Germany, Italy, USA, Japan and China, (see Figure 1) (Office of Communications (OFCOM), 2006).

In this report, **creation** is used in the most inclusive manner possible, referring to the **ability of individuals to bring new things into existence either through wholly individual effort or through the combination or re-combination of otherwise disparate and disconnected goods, ideas, activities**, and so forth. Creation in this sense is closely linked to **creative expression** and is often discussed in terms of individual capacities for realizing new forms of creation. **Distributed innovation**, on the other hand, refers to **group dynamics and capacities**, rather than individual ones, and can take various forms ranging from the activities carried out by creative industries which are supported by policies and economic systems, to activities carried out by otherwise disconnected individuals who are brought together or connected for the purpose of contributing to a creative effort that is the result of combined effort.

Manuel Castells argued in 2001 that “the **most important latent demand [is] for interactive free expression and autonomous creation** – nowadays largely stymied by the sclerotic vision of the traditional media industry.” Examples include “open source, free posting, decentralised broadcasting, serendipitous interaction, purpose-oriented communication, and shared creation” (Castells, 2001, p. 200). In this context, Katz and Rice (2002, p. 5) apply the term “Internet enabled expression” which “refers to the material that is created by individuals or groups to reflect their views, interests, or talents. These materials are produced for the observation, interest, or response of their creators and, usually, others”. This definition clearly points towards the overlap between self-generated content and civic and political participation.

The Oxis 2009 study produced at the Oxford Internet Institute examined content production and concluded that online content production is still relatively rare among users, although it is

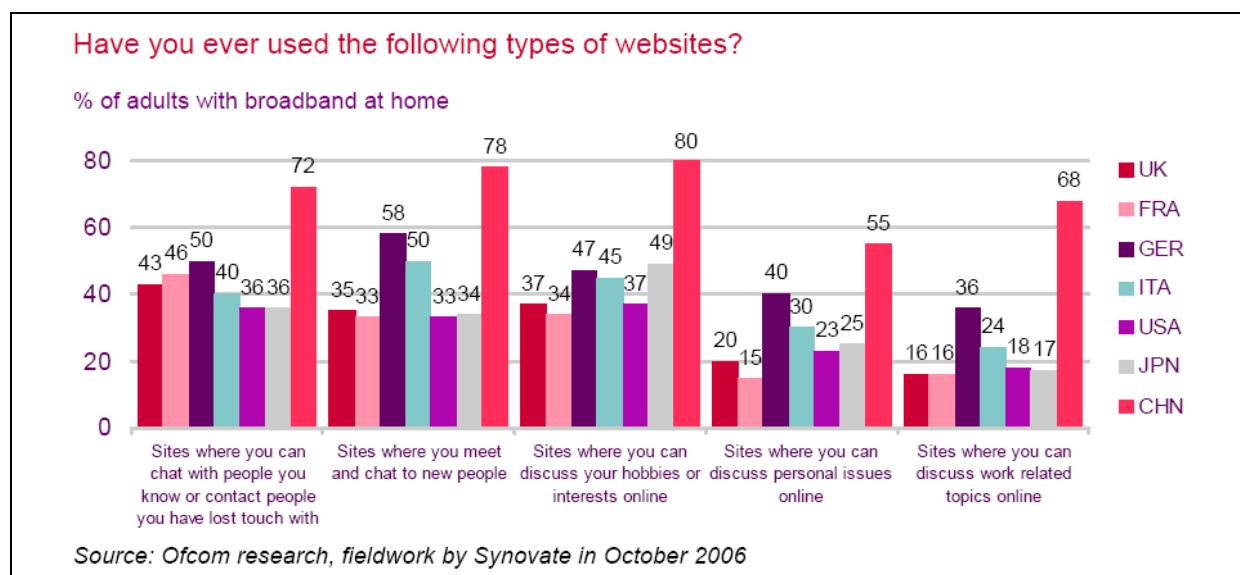
¹ Data from February 2009 according to <http://blog.communiquepr.com/?p=330>, reporting Myspace company data.

² Data from March 17, 2008 according to <http://ksudigg.wetpaint.com/page/YouTube+Statistics> from a relatively small sample of uploads on one day.

³ Data from April 2009 according to <http://www.nickburcher.com/2009/04/facebook-usage-statistics-by-population.html>, reporting Facebook company data.

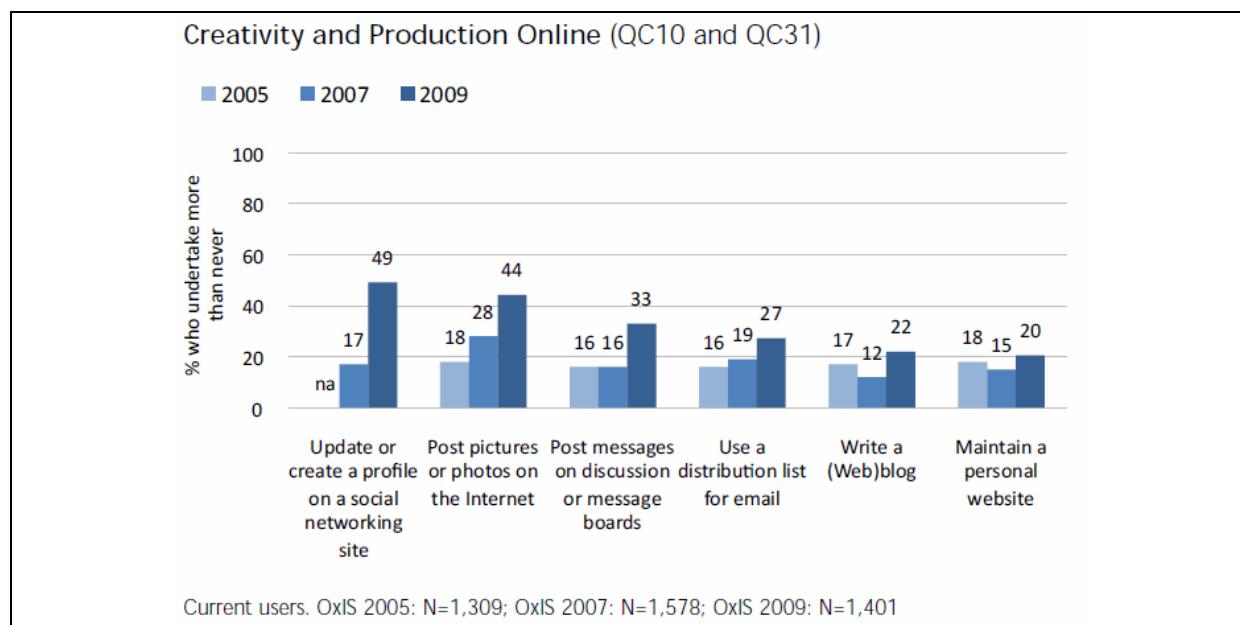
growing in some areas. Figure 2 shows recent data for various types of the creative production of online content. The most popular creative activity online is creating a profile on a social networking site (49%), up from only 17% in 2007. Posting photographs is the second most popular, an activity reported by 44% of users in 2009, up from 28% in 2007 and only 18% in 2005 (Dutton, Helsper, & Gerber, 2009). These **recent dramatic increases** suggests that the barriers to becoming creators of content are starting to fall. The Flash Eurobarometer 241 data presented in Figure 3 and elsewhere in this report show similar rates of photograph posting, with 40.8% of respondents reporting sharing photos or videos online. The opportunistically collected data in Figure 4 show that while over half of all Internet users report some sort of creative activity online, for most this is limited to simple activities such as updating one's status. For most creative activities, numbers remain low, in the 5% range.

Figure 1: Use of social networking sites on the Internet in 2006

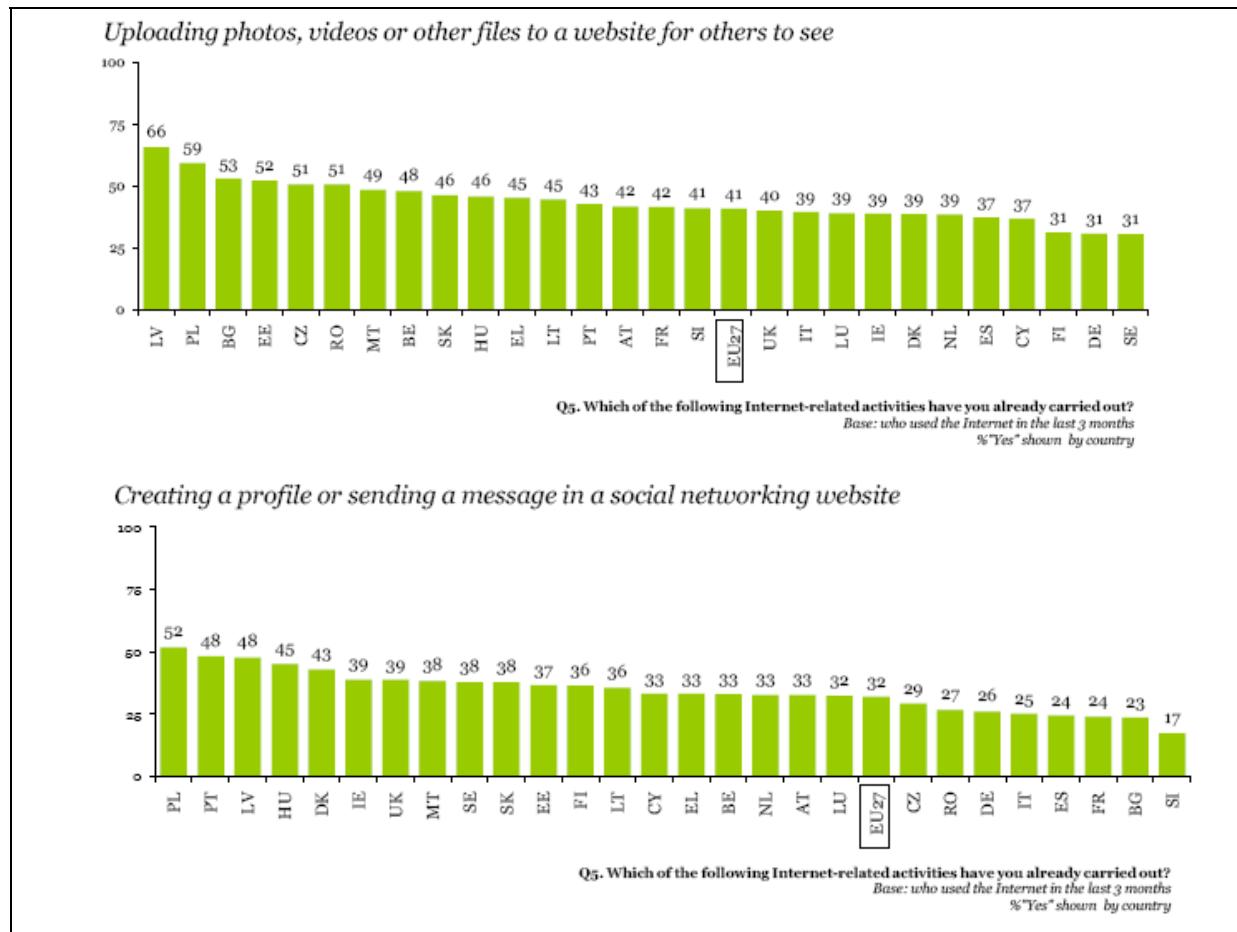


Source: OFCOM (2006)

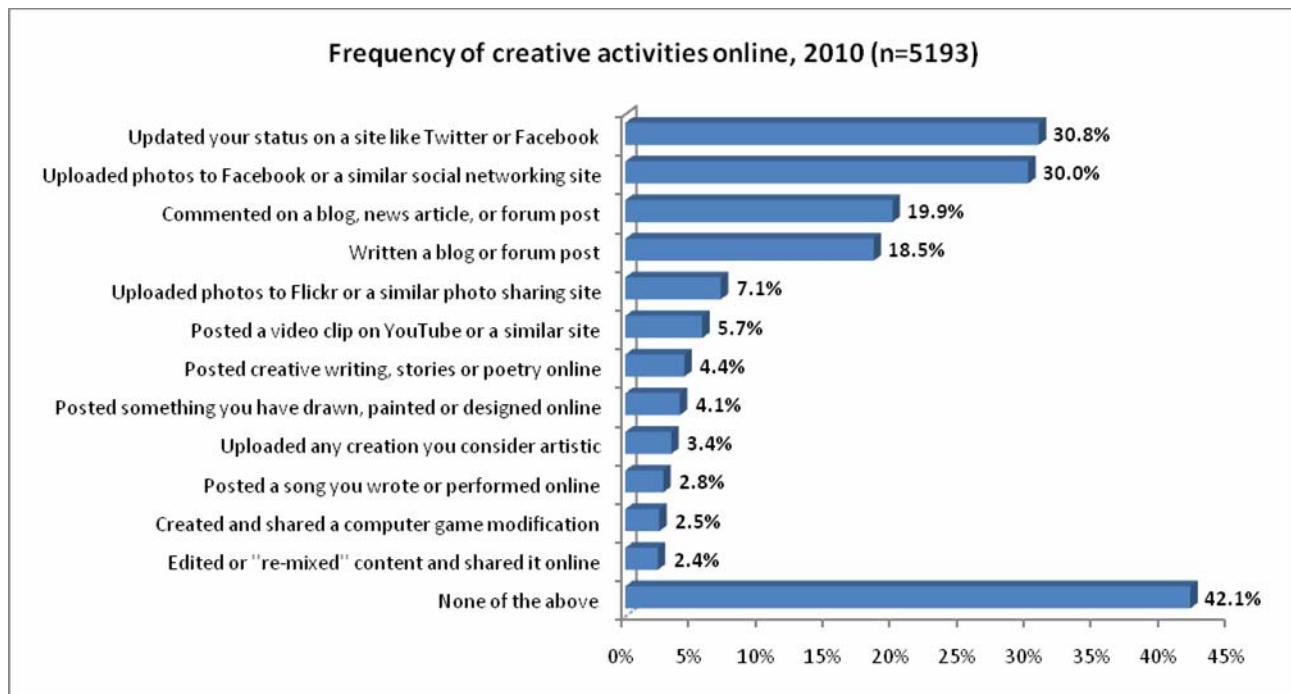
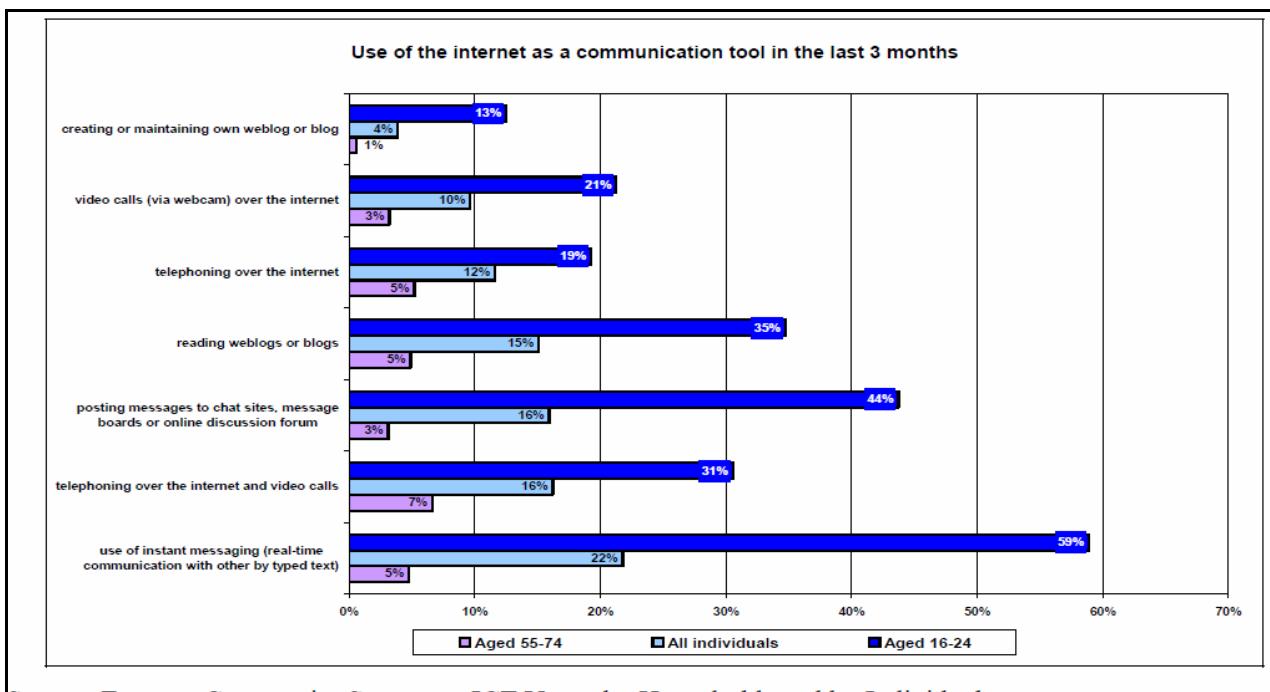
Figure 2: Creativity and production on the Internet in the UK, 2005-2009



Source: Dutton, Helsper & Gerber (2009)

Figure 3: Uploading photos and creating profiles in the EU, 2008

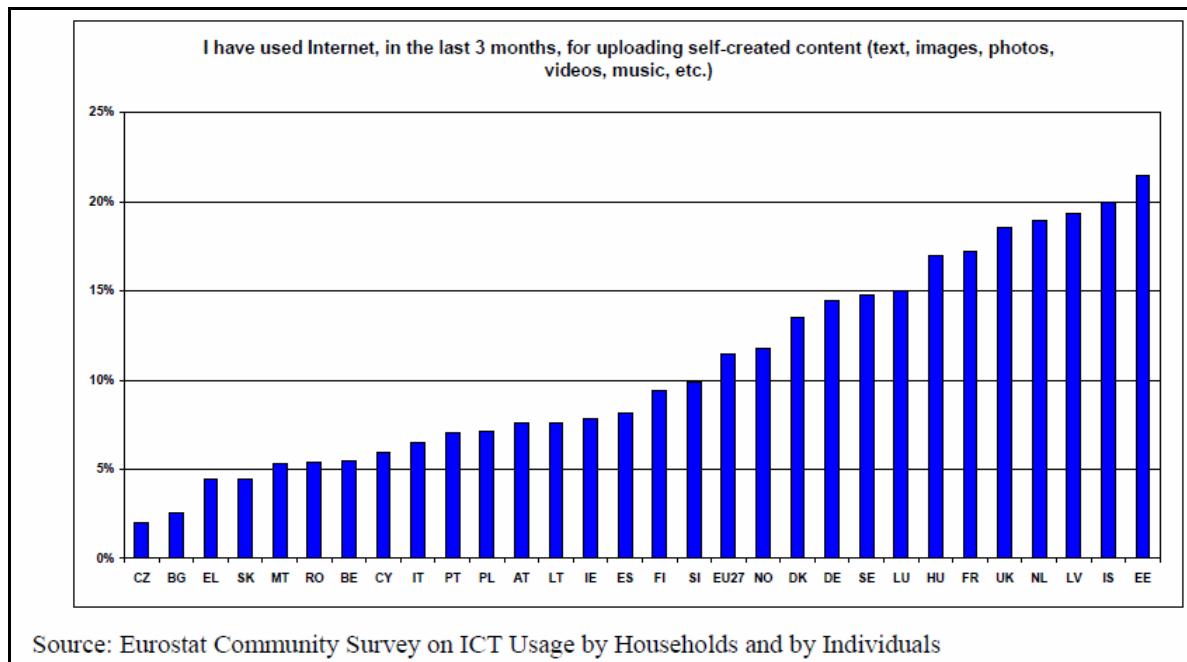
Source: The Gallup Organization (2008, pp. 22, 24); Data source: Flash Eurobarometer 241

Figure 4: Creative Activities Online, 2010Source: OII/Toluna Quick Survey⁴, 8-11 January 2010**Figure 5: Uses of the Internet in Europe, by age, 2009**

Source: Eurostat Community Survey on ICT Usage by Households and by Individuals

Source: European Commission (2009a)

⁴ Opportunistic sample drawn from a cross section of active Toluna community of respondents worldwide.

Figure 6: Creative uses of the Internet, by European country, 2009

Source: European Commission (2009a)

Data from the Eurostat Community Survey also show **increasing levels of content creation** with relationship to communication uses of the Internet, although these data also underscore the point that straightforward communication uses of the Internet, such as instant messaging or voice-over-IP, and **consuming information, such as reading blogs, is more common than creative activities such as creating one's own blog**. This will likely always be true, as content creators will always be in smaller supply than content consumers. The question is, however, does the Internet sufficiently lower barriers to becoming a content creator that those who aspire to content creation are able to do so without unnecessary barriers preventing their entry?

A recent study of YouTube found that new (at least to YouTube) content creators generate a significant portion of the videos posted: "in over 1 million users' data, we found that 58% of the users have no [YouTube] friends" (Cheng, Dale, & Liu, 2007). That newcomers to that site are deciding to create and post content indicates that compelling new sites such as YouTube are helping users overcome the barriers set up by traditional media that Castells referred to above. YouTube, MySpace, and Flickr are all sites for sharing user-created content, and all are in the top 30 websites in terms of traffic reported by Alexa.com (as of 1 June 2009). Other popular sites, such as Wikipedia (#7 on Alexa) are also arguably allowing people much easier access to becoming creators of content. Users with a particular interest in a subject can go to Wikipedia and update entries for which they feel they have particular expertise, even if they aren't credentialed experts in the traditional sense. If their contributions are valuable, they will persist through later edits by other users. In addition, Wikipedia allows the creation of content on topics that users may find extremely interesting or valuable, but that fall outside the realm of traditional reference sources.

When discussing creative content online, it is often an underlying assumption that user-created content refers to amateur content, as opposed to websites designed for sharing the professional creative content of organizations. There is, however, a grey area in between these two that is less discussed, but is also an important source of user-created content: the creation of content by users who may be expert in one area (music, art, writing) but are not expert web-designers nor affiliated with professional content distributors. The growing number of websites that enable these less technical users to create and share content online

also represent an important source of creative activity and distributed innovation. For instance, there have been recent changes in the stock photography industry as purchasers of stock photography have become less willing to pay high prices to professional stock agencies such as Corbis or Getty, and instead are buying inexpensive rights to photos on Flickr or stock websites like iStockphoto.com that allow small-scale photography operations or individual photographers to contribute content. Similarly for music, iTunes and mySpace have provided outlets for smaller independent bands to distribute their music to a wider audience without needing to become computer programmers to do it. This democratization of the content creation domain has important implications across the arts as traditional gatekeepers are bypassed and creators are able to connect directly with their audiences.

Creative expression can take many forms, and only some of these are currently well represented on the Internet. **For instance video (YouTube), music (MySpace), and photography (Fotolog, Flickr) are all well represented online**, and these online instantiations appear to be having and influence on how video, music and photography are used generally in the offline world as well. **Other types of creativity such as dance, drama, and poetry are not yet a large part of the mainstream creative community online**, and may never be. Additional forms of creativity, such as art and creative writing, lie somewhere in between. While digital arts and animation are becoming more prevalent, there is less evidence that traditional forms of art such as painting, drawing, and sculpture are being heavily influenced by ICTs outside of forms of new media art⁵. Likewise, while some creative writing appears online, most literary output still appears to be primarily in more traditional forms. Whether this is likely to change in the future is something that is of great interest.

An alternative of defining user activities has been provided with the accumulation, creation and archiving model (Schaefer, 2008), distinguishing user activities according to the different quality of cultural production, that revolves firstly around using and reusing media content originally produced by the established media industry (accumulation), and secondly describes organizing, maintaining and making accessible of data stored online (archiving), and thirdly describes the creations taking beyond the established channels of production and distribution as alternative and new construction of artefacts (construction).

Creative expression online also raises a number of potentially **contentious issues**. While few would argue that posting a photograph of a flower garden is problematic, when one person's definition of creative expression includes posting something more controversial such as nude photographs, additional issues arise regarding the ethical and legal issues surrounding the use of ICTs. **Ethical and legal dilemmas** can arise in many artistic domains. For instance, sharing music created by one's own garage band is perfectly legal, but is creating a 'mash-up' using someone else's band's music combined with additional elements such as new video content infringing on the other band's intellectual property⁶? Posting videos of yourself on YouTube can be non-controversial (particularly since YouTube is monitored for non-complying uses), but what if adults choose to post explicit videos of themselves on X-rated video websites? Is that form of creative expression equally valid, and who determines that? Flickr has made posting photographs very easy, but it has also made photographs very easy to steal; this raises the issue of how creators can keep track of the ways their content may be 'repurposed' without their knowledge.

⁵ New Media Art is a very new phenomenon, represented in Europe at places like Goldsmiths University of London (<http://www.gold.ac.uk>), Netherlands Media Art Institute/Montevideo (<http://www.montevideo.nl/en/>), Mediamatic (<http://www.mediamatic.net>) and Rijksakademie (http://www.rijksakademie.nl/uk_index.htm).

⁶ Although the question of intellectual property and protection of intellectual property rights is extremely important, it lies beyond the scope of this report. To deal with the IP issues raised by digital content would require a book, as the legal issues are vast and complex in this area.

The forms of content creation discussed here are not yet adequately understood and represent a potentially valuable source of data for understanding the ways in which people express creativity, types of creative expression that have been enhanced by ICTs and which types have not begun to engage ICTs, and what sorts of people choose to generate content and how this varies by age, gender, ethnicity, geographic location, and other characteristics. Artistic expression is one of the elements of self-actualization perched atop Maslow's hierarchy of needs, and the ability of ICTs to help people realize their artistic capabilities can represent an important impact on a person's overall quality of life. Understanding how this is happening and is developing for the future thus is an important component to assessing the social impact of ICTs.

2 Epochal trends in creativity and the arrival of ICTs

This chapter of the overall report is structured, as the others, to first consider the major epochal trends in the area of creativity and distributed innovation without regard to ICTs before turning our attention to the applications of ICTs in the domain, and the evidence for the social impact of these innovations. The chapter will end with a discussion of the policy implications of these trends.

2.1 Creative expression

Creative expression and distributed innovation covers a huge range of human activity. Music, art, drama, dance, creative writing, film, crafts, hobbies, play, and various forms of social engagement all allow people to express their creative urges. In many ways, this domain is one of the easier to imagine how it would have developed without ICT since to a large extent, **there has been remarkably little encroachment of ICTs into certain areas of this domain. Others, however, have been almost completely transformed by ICTs**, as we will see in the following section. There is an active literature on creativity and creative expression, but relatively little of that work has focused on how creative expression has seen the impacts of ICTs.

The first question that arises is asking what creativity actually is, how it arises, and what impact creativity has in the broader society. Sternberg et al. (2002) **define creativity as “the ability to produce work that is novel (i.e., original, unexpected), and appropriate (i.e., useful, meets task constraints”** (p.1). Sternberg & Lubart (2001) argue that **creativity goes beyond intelligence**, that creativity is judged in relation to the context in which it operates, and that “what is creative in one context may not be in another” (p.361). One key element, however, is that **many forms of original creative thinking and expression are crowd-defying**, and thus may result in resistance from mainstream audiences⁷.

Cliche et al. (2002) point out that **“artistic creativity is no longer regarded solely as a trait or talent of an individual actor, but as collective stocks of intangible assets that are accumulated and maintained** both individually and in related cultural production processes and ‘creative milieus’”. As a result, their report recommends **strengthening networks of people and organizations** which govern creativity through cultural and creative policies that build a growing stock of creative resources which in turn generate additional ideas and visions. These networks consist of several ideally synergistic lines of policy: one line to nurse creativity, one to manage economic and legal provisions for compensate creators, and one to intervene in markets to promote supply and expand demand of the outputs of creative expression.

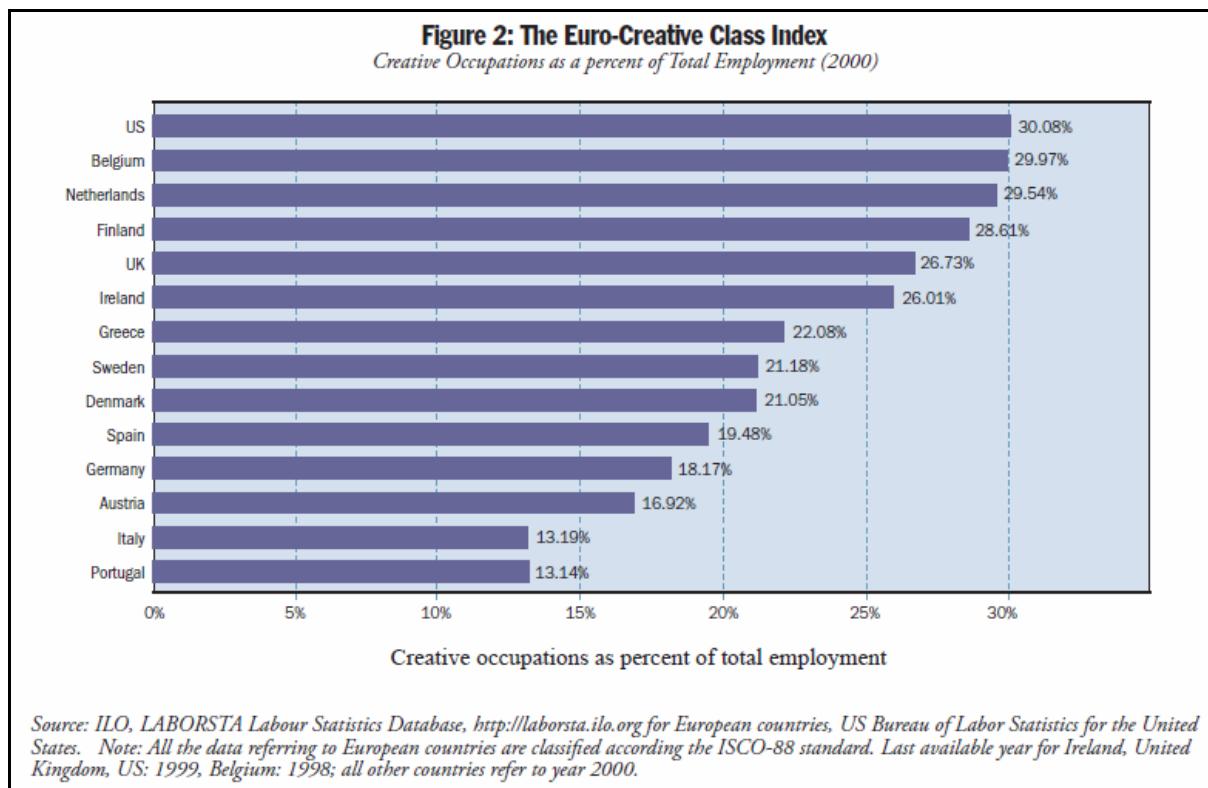
⁷ See also Koestler (1964), *The Act of Creation*.

2.2 Creative industries

Florida & Tinagli's (2004) work examining the role of creativity in economic development extends Florida's earlier influential book that relied primarily on understanding the American context (Florida, 2002). Bentley, in the preface to the Florida & Tinagli report, argues that **creativity has become one of the driving forces of economic growth**: "the new 'creative class' is drawn to a particular quality of place: open, diverse communities where difference is welcome and cultural creativity is easily accessed. Result: the new economy thrives in places which combine what Florida calls the three T's of technology, talent and tolerance" (Florida & Tinagli, 2004, p. 8). Florida & Tinagli present the following data to support their position⁸:

- **More than 25% of the workforce works in the Creative Class in 7 of 14 European countries** in their study
- **Creative workers outnumber blue-collar workers in the Netherlands, Belgium, Finland, the United Kingdom, Ireland and Denmark**
- **Particularly strong shifts towards the Creative Classes in Scandinavian, Nordic and northern European countries.** Sweden, for instance, ranks ahead of the US on the overall Euro-Creativity Index, while Finland and the Netherlands also do quite well and are at comparable levels to the US
- **New centres of creativity can emerge quickly**, and the competitive epicentre of Europe, according to the data in this report, appears to be shifting from traditional powers such as France, Germany and the UK to Scandinavian and northern European countries

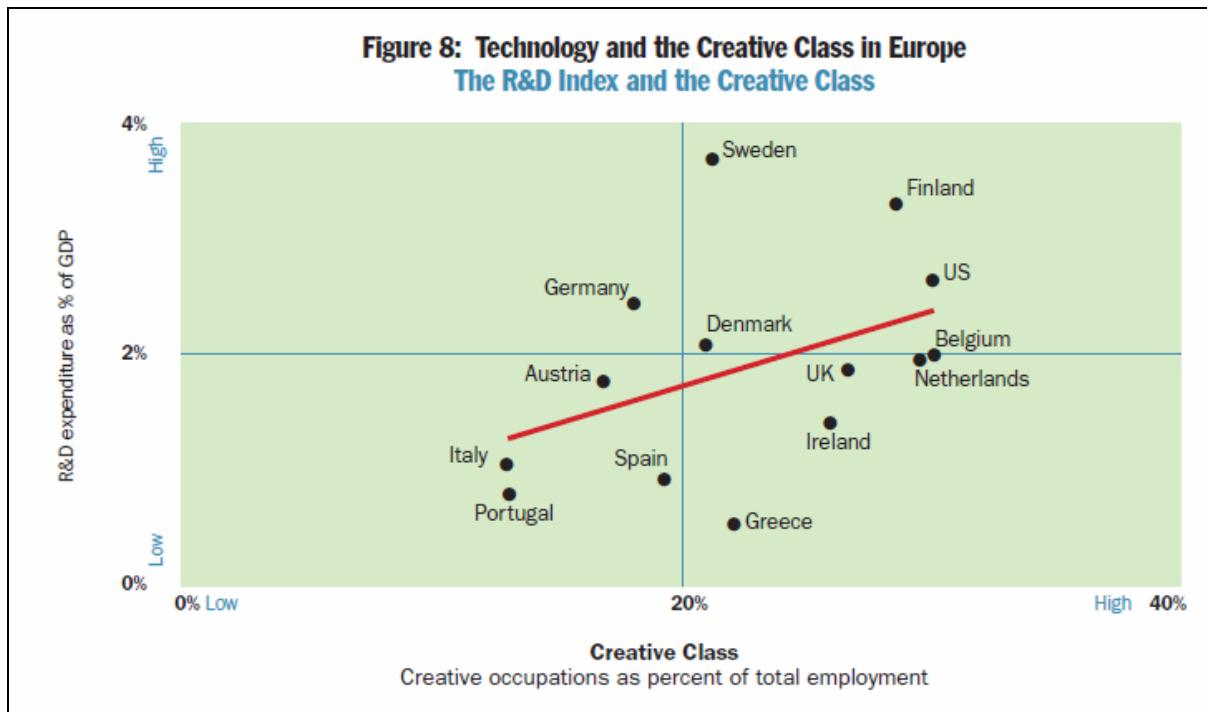
⁸ It should be noted that there are ongoing debates about Florida's work on creative classes. In particular, despite the popular success of Florida's work and the merit in drawing attention to the subject, the scientific soundness of Florida's analysis has been disputed both by economists and humanities scholars. In particular, Florida's definition of creativity is often considered to be too broad and thus, potentially misleading. Some critics have questioned whether Florida is really measuring cultural capital, since his data focuses on technology (R&D), talent (education) and "tolerance". With regard to the latter factor, it might be debatable whether tolerance can really be regarded as a distinct factor to spur growth from creative sources or whether it is actually attracting talent, as Florida himself mentions at other places. Moreover, some scholars maintain that other factors are more important. So, is culture and openness really attracting creative people to certain locations or do they in fact also make their decision dependent on features of a place such as infrastructure, cost of living etc.? These are only some potentially relevant aspect of the debate. One good overview of these issues is Peck (2005).

Figure 7: Euro-Creative Class Index

Source: Florida & Tinagli (2004)

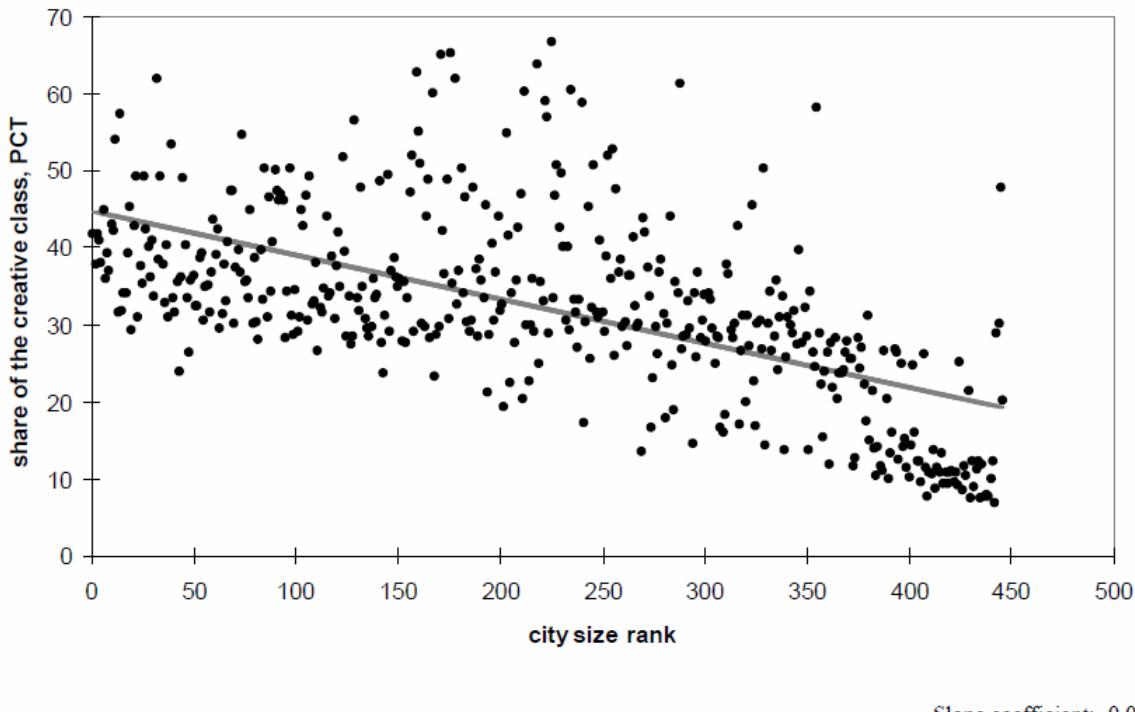
In Figure 7, the Euro-Creative Class Index for 2000 shows the portion of employment various European economies that is comprised of people in creative occupations. While the US leads Europe on this scale, a number of countries are comparable with the US. Further, in the chart below, which compares technology in the form of R&D expenditures to the Creative Class index, Florida and Tinagli argue that the **countries occupying the top right quadrant (high technology, high creativity) are particularly well positioned to compete globally with leading countries such as the US.**

It is important to recognize that the entire EU as environment can stimulate creativity through policies. As a survey of the Deutsche Bank Research emphasizes such policies could be useful to prevent overly restrictive software patents which threaten to stifle creativity and innovation in Europe (Deutsche Bank Research, 2004).

Figure 8: Technology and the Creative Class in Europe

Source: Florida & Tinagli (2004)

In a related study, Lorenzen & Andersen (2007) analyzed the geographical distribution of the creative classes in Europe. They found evidence for a relationship between city size and attraction of creative labour. In the chart below, the authors report the correlation of European city population rank and the share of the creative class in 2000. This chart shows that **larger cities also garner a higher share of the creative class relative to their size**. The smallest cities at the right end of the scale, in particular, have a sharp drop-off once they are below a particular size, which the authors report is a population of about 70,000. They also argue that the **presence of an active creative class in certain cities has an additive effect**, with an active creative sector attracting additional investment in creative industries and immigration by the creative classes. While this "Matthew Effect" (Merton, 1968) of the rich getter richer is not terribly surprising, it does underscore the need to develop creative capacity for creative industries in appropriate urban settings. On an individual level, however, the **Internet arguably opens up entirely new possibilities of creative expression and participation in rural areas as well**, and it is important to also develop individual capacities using technologies such as the Internet to go far beyond the creative urban centres and reach individuals and small groups who can also benefit by participating in a creative Europe. Even where creative industries may not develop due to a lack of critical mass, creative individuals can still develop.

Figure 9: European cities and creative classes**Figure 7: The correlation of European city population rank and share of creative class (2000)**

Source: Lorenzen & Andersen (2007)

Most of the work described above focuses on professional and semi-professional creators and innovators (see Mumford (2003) for a discussion of relevant work in this area). However, as we will see again, the arrival of the Internet and its many outlets for non-professional creative expression are blurring the boundaries.

In a talk at Web 2.0 Expo⁹, Jeff Veen suggested that the shift to creating content actually has its roots in 1974, with the end of the read-only consumption of media and the beginnings of participation in government, music, computing, and other areas of life. While his focus is on the United States, this assertion gives a hint that the general basis for this exercise of trying to see the impacts of ICT by imaging a world without ICT actually is quite difficult as the origins of many changes go back quite a long time when viewed through certain lenses.

2.3 Subdomains

In order to discuss major societal trends in the expression of creativity, it will help to subdivide our discussion into several different, but related, sub-domains. Each sub-domain will be briefly surveyed to discuss the major societal trends over the course of the last several decades.

⁹ In San Francisco in 2009

Music

Considerable changes in music have happened in the last 25 years, some of which are related to technologies other than the Internet and communication intensive ICTs. For instance, the evolution of music from live venues as the only source of high-quality audio to increasing levels of fidelity in audio quality from monaural records to stereo records to 8-track cassettes to CDs has been continuing for decades. **Popular music has been a huge driver of technology innovation**, as consumer tastes helped push the development from stereo decks to 8-tracks to Walkmans to iPods. While audiophile purists may decry the quality of compressed digital forms to richer analogue means of audio production and reproduction, it is easy to argue that the shift to digital has democratized the production and consumption of music. While analogue recording required expensive studios and mixing equipment, small bands and music producers can now create professional-quality recordings of music with relatively modest investments in technology.

Another trend that is not directly related to ICTs is the **rise of the DJ** in popular culture. Souvignier writes of the Turntable Culture, arguing that the success of the turntable in the 20th century in turn drove innovations in technology that would eventually lead to the digital forms that dominate music today (Souvignier, 2003). DJs were early adopters of what would eventually become “**clip culture**” as seen on YouTube and other sites where prosumers **sample, edit and remix audio (and video) to create new expressions** of music. DJs did, and often still do, this using the analogue form of the turntable.

At the same time, music prior to the introduction of ICTs was seen as **increasingly dominated by corporate interests**. For instance, McKay writing in the 1990s, lamented that “the control of the worldwide music industry has become increasingly concentrated in the hands of a few very influential multinational corporations over the past several decades” (McKay, n.d.). However, by 2006, Rob & Waldfogel were reporting that “recording industry revenue has fallen sharply in the last 3 years, and some—but not all—observers attribute this to file sharing” (Rob & Waldfogel, 2006).

The barriers to entry in the music industry without the introduction of ICTs were high, and would have likely remained high. While pop and rock music has been consistently marketable and profitable (including in the current era of illegal downloading and filesharing), other forms of music with less widespread appeal faced an uphill battle. Without distribution by a major label which controlled the supplies of music to record and CD stores and had a stranglehold on access to radio playlists in major markets, artists found themselves closed out of markets. Genres such as Indie music, folk music, world music, and so forth faced considerable difficulties of distribution, attracting audiences, and gaining financing.

The general picture of the creative production of music without the introduction of ICTs is less democratic than our current system, but also less chaotic than we currently see. However, one could argue that a certain degree of chaos and uncertainty can inspire creative outputs.

Film & video

Film and video production prior to the introduction of ICTs was primarily the domain of professional producers of content, including movie studios and major television studios and producers. However, there are counter-examples of early non-ICT-based forms of amateur creation of film and video content that give some indication that the current flowering of creative uses of film and video was a latent demand waiting for the right technology to allow it to flower. The first of these is the rise of hand-held movie cameras (such as 8mm and Super8 consumer models) that goes back as far as 1923, when film formats were first standardized (Schneider, 2003). Over the course of the 20th century, **home movie making was a popular activity, particularly for the middle classes**. This popular activity would only increase with the diffusion of the VCR and the resultant popularity of camcorders which allowed users to create their own content.

However, the **content being created with home movie cameras and camcorders was not, by and large, made for public consumption**. While the movies and videos would be shown to family, friends and neighbours, only rarely would an amateur video be distributed further. Also, **editing was relatively uncommon** as it required considerable complexity and skill. Editing moving film requires careful cutting and splicing, while video editing requires special control equipment and multiple recording decks to accomplish. As we will see below, the arrival of **ICTs have changed this equation almost completely**.

Photography

Photography has had a profound impact on the world since its introduction in the mid-19th century. From its very beginnings, its potential as a disruptive technology has been argued: "By this process, without any idea of drawing, without any knowledge of chemistry and physics, it will be possible to take in a few minutes the most detailed views, the most picturesque scenery, for the manipulation is simple and does not demand any special knowledge" (Daguerre, 1839/1980). As Meyer writes:

The social impact of photography can be discussed on multiple levels: from the social changes associated with the easy production of family snapshots used to record personal histories to the social impact felt by influential photographs that have documented the range of human suffering in the world. From Matthew Brady's Civil War photographs, to the Works Progress Administration (WPA) photographers who documented America in the depths of depression, to Vietnam-era images of war and protest, to digital photographs of torture in Iraqi prisons, photographs have influenced public perception of events and molded public reaction to public policy" (Meyer, 2008, p. 178)¹⁰

The **impact of photography on the citizenry has been profound in the sense of creating a means of creative expression for the masses**. Cameras have been popular since the introduction of simple consumer models such as the Brownie at the very beginning of the 20th century. The hobby of photography as well as the growth of simple snapshot photographers recording personal and family events showed no signs of abating prior to the rise of ICTs. In the 1970s and 1980s, Instamatic and single-use cameras proliferated, and a range of consumer models of point-and-shoot 35mm cameras and affordable SLR cameras were being developed well into the 1990s. Because of this, there is no reason to suspect that engagement with photography would have lessened; it is **likely that photography would have continued to grow even without ICTs**. However, as we will see below, **ICTs have opened up a whole new range of ways that people can interact with photography**.

Non-mainstream art, writing, and fantasy

There were non-ICT-related changes taking place in the late 20th century in other areas of non-mainstream forms of creativity, including areas such as cartooning/graphic novels, the writing of "fanfic" (fan-written fiction) and 'zines, the spread of urban graffiti, plus the rise of installation art and art as performance. All of these less traditional forms of expression were in full flower in the late 20th century, and many have successfully moved online with the advent of ICTs. Cartooning and graphic novels remain a popular form of expression, both in print and digital format. Fanfic and 'zines, on the other hand, were blossoming in print format but faced the distribution problem inherent in print media: although audiences for fringe publications such as these are small and often widely distributed geographically, printing is more suited to local distribution, or at least to intra-national distribution via post. International mailing has always been expensive, and cost prohibitive for most small-scale publications of this sort. Whether these fringe forms of expression would have survived in the long term without the growth of ICTs is unclear: certainly individual publications would have closed in

¹⁰ Meyer also cites (Berger, 1980/2003; Eco, 1986/2003; Marien, 2002; Sontag, 2003)

some cases, or grown into larger scale operations in others. However, the widespread practice of small-scale publishing of these materials would likely have continued. In fact, the most important technology for this sort of small-scale publishing was the Xerox machine. When copying became cheap and readily available, the opportunities for creating large runs of cheaply printed materials became possible. As we will see, however, ICTs have removed many of the other barriers to these forms of expression.

In terms of **artistic forms such as urban graffiti, installation art, and performance art, there is less evidence that ICTs have had considerable impact**. These three examples, however, give a clue already to the types of creative expression for which **ICTs are least relevant: those involved with physical incarnations located in space and place**. Graffiti, as a form of public art, is at least partly about grabbing the attention of a (possibly unwilling or unappreciative) audience. Likewise with installations and performances: these forms do not have obvious direct parallels in the online world, although there are examples of offshoots that can survive online, such as posting performance art on YouTube to reach a wide audience than the small number of people who would normally attend an event of this nature.

Counter examples

It would be remiss not to discuss some areas in which it is fairly easy to imagine how the domain would have developed without ICTs, because they appear to have been relatively little changed by ICTs over the past 25 years. **For instance, theatre and dance has, by and large, remained a form of creative expression that still takes place with live performers, in physical venues, attended in person by audiences**. While there are fairly mundane technologies that have changed (sound and lighting control systems, for instance), the actual means of expressing creativity for the theatrical actor or dancer have changed relatively little.

Likewise, **classical music and some other forms of live music have changed little for decades, or even centuries in the case of something like chamber music**. Similarly, some art forms such as sculpture, painting, drawing and so forth are still done predominantly in physical forms, via non-technological means.

That is not to say that these domains have not experienced social changes during this period that are bringing new pressures. For instance, **changing audience demographics have many of these sub-domains worried about the future**. Theatre and classical musical audiences are aging, some museums and galleries struggle to attract attendance, the funds required to pay the operating expenses of expensive organizations such as orchestras and opera companies are in perennial short supply, and some organizations struggle to argue that they remain relevant in an increasingly competitive attention-space.

Europe has been proactive in this realm, however, in comparison to many other parts of the world. For instance, the **European Capital of Culture cities programme** has brought attention to various cultural activities since 1985. Each year, one city is highlighted, with the intention of bringing world attention, and also socio-economic benefits (Garcia, 2004). The European commitment to creativity is on particular display in 2009, as the *European Year of Creativity and Innovation 2009*¹¹ had “aims to raise awareness of the importance of creativity and innovation for personal, social and economic development; to disseminate good practices; to stimulate education and research, and to promote policy debate on related issues”¹². This initiative resulted in many events throughout Europe in 2009 dedicated specifically to enhancing creativity, and demonstrates the importance of this domain to the European Commission.

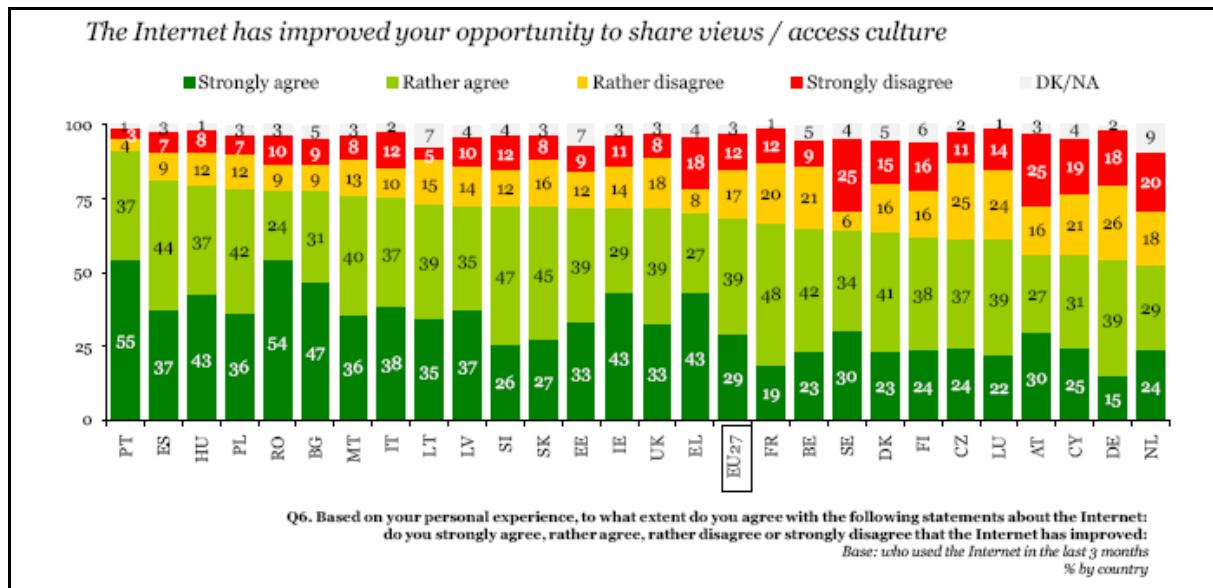
¹¹ <http://www.create2009.europa.eu/>

¹² http://www.create2009.europa.eu/about_the_year.html

3 Applications of ICT in Creativity

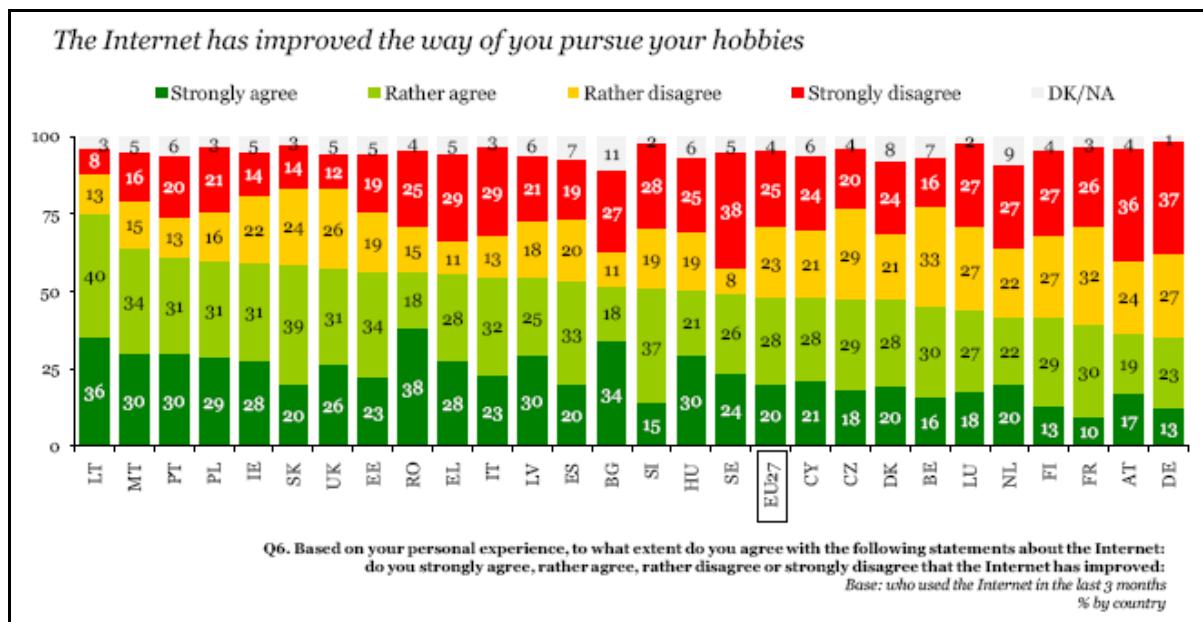
Even though there is considerable work on creativity, as we have seen, there has been much less work focused on understanding the impact of ICTs on the practice of creativity. Compared to democracy or commerce, for instance, where the societal and economic benefits of ICTs have been the focus of intense scrutiny for decades, many work and leisure activities focussed on creativity have, we suspect, been seen as peripheral, or frivolous, or an accidental side-benefit, but certainly not of central concern to most academic or policy analysts. With some exceptions such as expenditures on major musea like the Louvre, there haven't been massive funding efforts directed at ICTs in the arts comparable to those aimed at achieving cost savings in health care or efficiency and productivity enhancements in industry. Thus, many of the impacts of ICTs in the creative domain have been either small scale or accidental, and as indicated in the conceptual framework for this study, are more often trend amplifiers than revolutionary changes. Nevertheless, the data shown in Figure 10 shows that 68% of Europeans agreed that the Internet has improved opportunities to share views and access culture. However, whether fairly low-barrier forms of online participation in cultural production and consumption are serving as a gateway to higher levels of creativity online is still unclear.

Figure 10: Sharing and Accessing Culture, 2008



Source: The Gallup Organization (2008, p. 30); Data source: Flash Eurobarometer 241

Unlike some of the domains under discussion in this report, ICTs were fairly late arrivals (or, as mentioned above, even non-arrivals) in many of the sub-domains involving creative expression. Whereas business users were incorporating computer systems into their daily practices even before the arrival of the PC, it wasn't until the arrival of the Apple computer in the late 1980s that there was even a suggestion that computers could be actively harnessed for creative expression. The perception of this divide between Apple inspiring creativity and the PC being harnessed for business purposes has persisted until the current day. The evidence for this is clear: witness Microsoft's 'I'm a PC' campaign aimed at trying to convince people that, contrary to perceptions, Windows PCs are also used in creative ways.

Figure 11: Pursuit of Hobbies related to the Internet, 2008

Source: The Gallup Organization (2008, p. 34); Data source: Flash Eurobarometer 241

In each of the subdomains discussed above, ICTs have entered the subdomain at varying times and at varying rates. Some, as mentioned, have remained relatively uninvolved with ICTs. The following section will discuss the same subdomains as above, paying particular attention to the introduction of ICTs into the subdomain and the key applications of ICT with regard to creativity.

3.1 Subdomains

Music

Pop and Rock music production, creation, and consumption has been dramatically changed with the addition of ICTs in this subdomain. Digital distribution has clearly amplified the trends toward digital production and portability of music that started with the cassette version of the Sony Walkman and the CD. iPods and other MP3 players including many mobile phones now store hundreds or thousands of songs, and allow citizens to take music anywhere and listen to it anytime. The distribution of content digitally has had a particularly strong impact in the music sector (Abadie, Maghiros, & Pascu, 2008). According to the EC “about a quarter of European citizens have downloaded and/or listened to music online in 2008, with large disparities between Member States. In the Netherlands or Norway, 40% of citizens listen or download music, and in 16 other countries over 20% do so. The difference with the laggards reaches up to 25 percentage points” (European Commission, 2009a, p. 62).

The most contentious issue with downloading is the fight over illegal downloading, music piracy, and the efforts of rights organizations like RIAA, GEMA and others to limit the ability of consumers to download music, and to re-use, re-mix and re-create new content using portions of commercially produced content. The issue of copyright as it relates to music is a much larger issue than can be addressed in this report, however, so we can just note that the legal issues and challenges are still largely unsettled in this area, and will continue to develop in coming years.

A bigger question in the context of this report, however, is how many Europeans create music online. One indication of the growth of creation via digital outlets is that

"digital only releases and lower barriers to entry: 30% of music releases in the UK in 2006 were digital bundles (Telphia IFPI, 2007): Digital-only releases are becoming a growingly important strategy for the creation and distribution of content avoiding the costs and risks associated to physical production. An example of such phenomenon would be the success of previously unsigned group Koopa, who managed to reach the UK top 40 through digital singles sales (Youngs, 2007) (many through text message downloads), without resorting to mainstream distribution and marketing techniques" (Abadie, et al., 2008, p. 47).

For less mainstream music, **alternative distribution channels** such as MySpace, YouTube and iTunes have provided bands and solo musicians a new way to reach audiences directly, and also to profit from sales to a smaller set of purchasers than would be attractive to a major music publisher. While there are still challenges of attracting eyeballs and ears in the modern attention economy (Goldhaber, 1997) the general effect has been democratizing.

Note that there is a difference between the creative act of content creation, such as writing or performing a song, and the creative act of content sharing and remixing. Neither is actually dependent on the other, although they are linked. So, one person can create and share, or one person can create but not share, and another can share the things other people have created. The issues gets even more complicated when you consider that **re-mixing from a variety of sources is viewed by some to be a creative act, while others view it as a form of theft**. These issues will not disappear anytime soon.

Film & video

Film and video production, particularly in the form of digital video, has been dramatically altered in recent years, and these changes are tightly linked to ICTs. While digital video cameras were initially expensive and required expensive editing software running on powerful computers, today nearly every point-and-shoot camera and mobile phone includes the ability to take at least basic video. These videos can be uploaded directly to sites such as YouTube, and if they go viral, can be seen by thousands or millions of people within hours or days. This **democratization of video creation has meant that many more people are creating video**, although it also arguably means that many more poor quality videos threaten to swamp the market for quality videos made by amateurs or low-budget professionals. The counter argument, however, is that regardless of the amount of low quality video is produced, the quality video will continue to rise to the top as users vote up good content on sites like YouTube, but also on aggregators like Digg or Reddit.

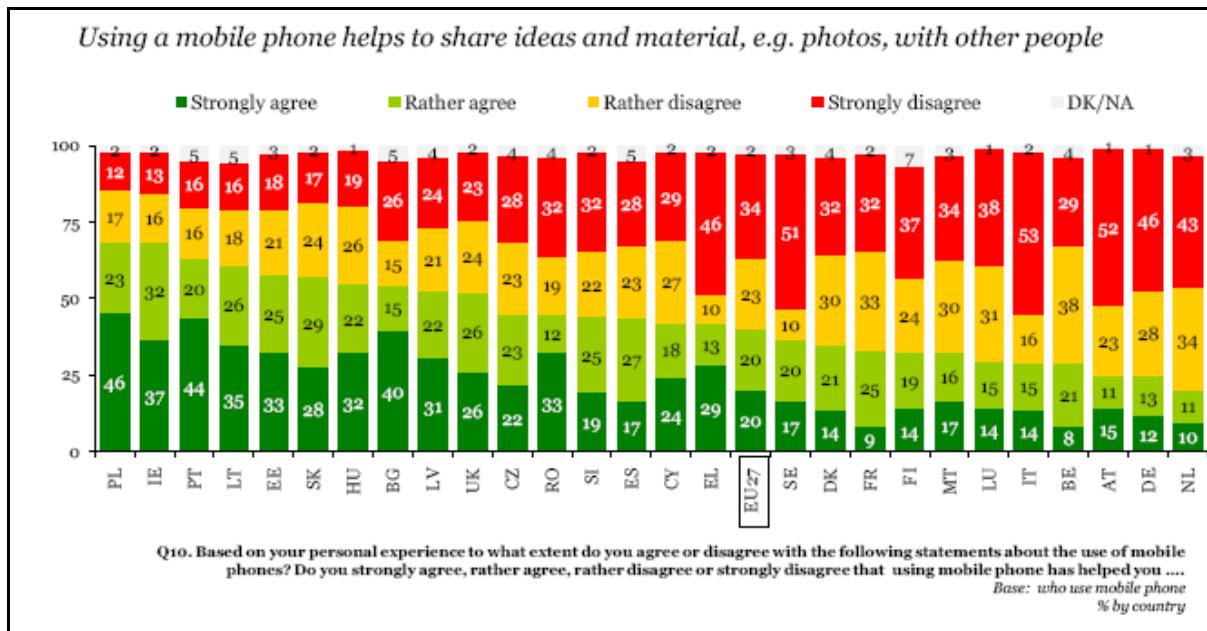
It is important to note that even though anybody *can* make a video these days, there are still **differences between frivolous amateurs, serious independent film makers, and professionally produced content**. Television, for instance, has remained centralized and mostly unidirectional even though heavily invested in ICT. Hugely popular video delivery mechanisms such as the BBC iPlayer deliver not video produced by citizens, but professional content from the BBC. The question for the future is to what extent serious independent sources of quality video will be able to carve out a niche for themselves as television and the Internet threaten to converge even further.

Photography

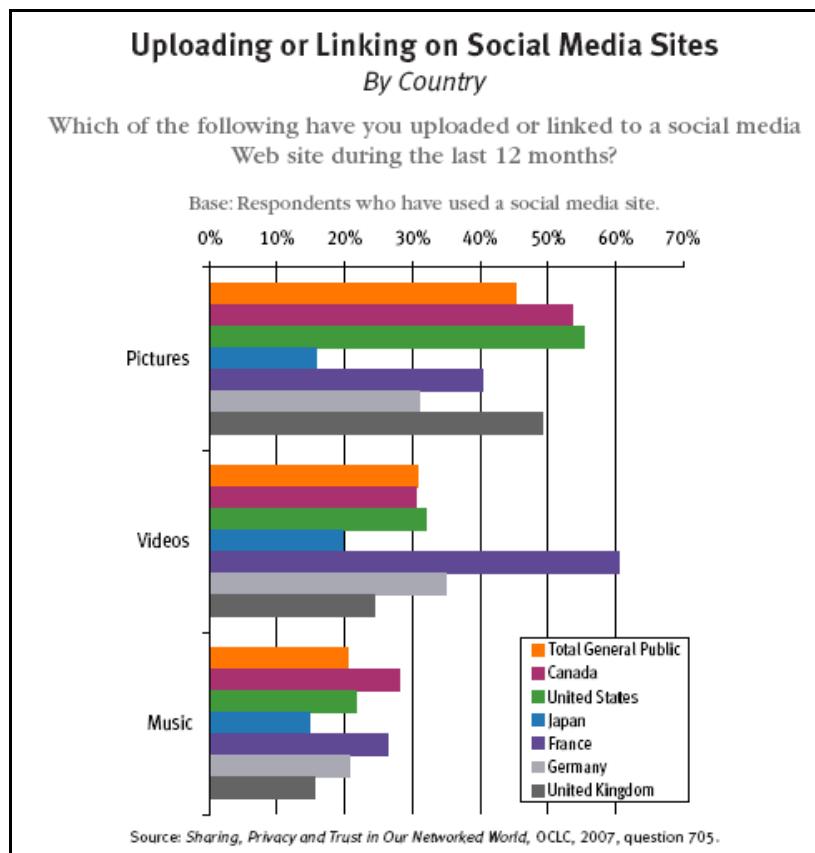
Photography has almost completely converted from analogue to digital technologies over the past decade. Most film producers have either closed or seriously curtailed their film production lines as digital cameras have completely supplanted film cameras. Cameras, like music players, have become ubiquitous as they are miniaturized and embedded in mobile phones (Petersen, 2008). Easy to use photo sharing sites like Flickr or fotolog currently get thousands of new photos posted *every minute* and millions of new photographs each year. As mentioned previously, photography has always been a popular hobby, but the change with ICTs is that **photography has been a publically visible hobby, a means of sharing creative expression easily not just with friends and family but with strangers all over**

the world, and a means of communication visually online. The physical act of taking a photograph has actually changed very little: using a device that looks very much like a film camera in many cases, one sees an image through a viewfinder or on a screen, and presses a button. With essentially a marginal cost of zero per additional photograph, however, and the ability to store hundreds of photographs before needing to change memory cards instead of being limited to 36 shots on an expensive to purchase and expensive to develop roll of film, citizens are taking many, many more photographs than ever before, and are sharing them in ways that were wholly unheard of prior to the computerization of cameras (Meyer, 2008), as shown in Figure 12 and Figure 13.

Figure 12: Using mobile phones to share photos, 2008



Source: The Gallup Organization (2008, p. 59); Data source: Flash Eurobarometer 241

Figure 13: Uploading Content on Social Media Sites , 2007

Source: OCLC (2007, pp. 2-36)

Photography plays an important role in creating and re-creating culture, and this is reflected in public efforts to encourage citizens to share their photographs for civic aims. Examples of efforts to enhance European participation in creativity include the “Imagine a New World Photo Competition” sponsored by the European Commission in 2009¹³, with a top prize of €5,000 worth of photographic equipment and a trip to Stockholm for the closing ceremony of the European Year of Creativity and Innovation 2009.

¹³ <http://www.imagine2009.eu/>

Non-mainstream art, writing and fantasy

An obvious area of growth related directly to ICTs has been the video game industry. **While playing games is mostly a form of consumption, making games is a form of creativity and innovation.** Of course, breaking into the game industry is not trivial. A recent report by the EC says, "According to information from the International Software Federation of Europe (ISFE), commercial video game budgets for home consoles and PCs range from between 200.000 Euro for small handheld or PC games to up to 10-15 M Euro for large blockbuster games, developed over several formats simultaneously. The cost of developing a blockbuster massively multiplayer online game can be even greater" (European Commission, 2009c). However, there are still opportunities for break-out successes by developers of small applications for platforms like the iPhone that achieve viral success. According to DFC Intelligence, "Mobile game market sales will grow to \$11.7 billion by 2014, primarily due to the rapid adoption of Apple's iPhone and iPod Touch as gaming platforms...by 2014, sales of iPhone and iPod Touch games will account for 24 percent of total portable video game software sales...69 percent of European respondents played a game on their mobile phone in the past year...[and] 36 percent of European respondents bought an applications for their mobile phone, with Apple's App Store the most popular service for making purchases" (Graft, 2009).

In the areas of cartooning and writing such things as fanfic and alternative writing efforts, as with photography, ICTs have enabled huge growth in this area because it is much easier and cheaper to share one's output. As mentioned above, when writing for an audience consisted of copying written work using a Xerox machine and distributing it either by hand or via the post, the number of potential readers was quite limited. Now, however, anyone with a computer can set up a blog in a matter of minutes and start posting their written or drawn work, and attract attention through the many forums available for this sort of work on the web. As with photography, the act of writing has changed little: ideas still flow from someone's mind onto the page, even if the page now resides in a computer. However, **the ability to share those words has changed dramatically**, and this is having a profound effect on the ability of citizens to create written or drawn material for an audience.

In some writing, however, particularly longer form writing, we have seen less change. According to Abadie et al., a "smaller scale of change that ICT innovation has so far brought to the book and cultural spaces sub-sectors" (Abadie, et al., 2008) may yet change. **Long form writing still seems to belong in books, and people still seem to prefer reading longer form materials that way.** However, recent advances in eBook readers appear to be making some inroads into the book market. It will be interesting to watch in coming years whether the eBook reader gains a serious foothold in this market, and if so, whether there will be channels for independent authors to sell books directly to readers without the costs of publication, much as musicians have been able to partially bypass record producers.

For other short form writing, however, sharing and collaboration have had a huge impact. Probably the prime example is Wikipedia, which has gone in a period of a few years from nothing to a major reference work that in many ways not just rivals, but far surpasses any previous effort to create an encyclopaedic collection. With Wikipedia, enthusiasts of a subject can create new entries or modify existing entries in ways they never could with Britannica.

Figure 14: Reasons for Creating Web Pages, by Country and Age, 2007

Reasons for Creating a Web Page By Country

Earlier you mentioned that you created a Web page(s)/site(s).

Why did you create the Web page(s)/site(s)?

Base: Respondents who have created a Web page/site.

	Total General Public	Canada	United States	Japan	France	Germany	United Kingdom
To communicate with friends and family	37%	50%	36%	28%	43%	51%	33%
To write a blog and/or diary/journal	28%	23%	21%	53%	25%	11%	23%
To share photos	27%	53%	31%	13%	44%	22%	30%
To promote and sell products	21%	26%	26%	11%	11%	26%	18%
To publish my own writing or music	19%	16%	15%	26%	19%	26%	14%
To share information about homework	7%	6%	10%	4%	5%	6%	5%
To share information about online games	7%	9%	3%	11%	17%	7%	5%
To share videos	6%	10%	8%	2%	11%	4%	8%

Source: *Sharing, Privacy and Trust in Our Networked World*, OCLC, 2007, question 820.

Reasons for Creating a Web Page By Age

Earlier you mentioned that you created a Web page(s)/site(s).

Why did you create the Web page(s)/site(s)?

Base: Respondents who have created a Web page/site.

	Age 14/15 to 21	Age 22 to 49	Age 50+
To communicate with friends and family	41%	36%	34%
To write a blog and/or diary/journal	39%	26%	14%
To share photos	29%	29%	18%
To promote and sell products	3%	25%	36%
To publish my own writing or music	24%	17%	16%
To share information about homework	9%	7%	5%
To share information about online games	12%	6%	1%
To share videos	11%	5%	4%

Source: *Sharing, Privacy and Trust in Our Networked World*, OCLC, 2007, question 820.

Source: OCLC (2007, pp. 1-13, 11-14)

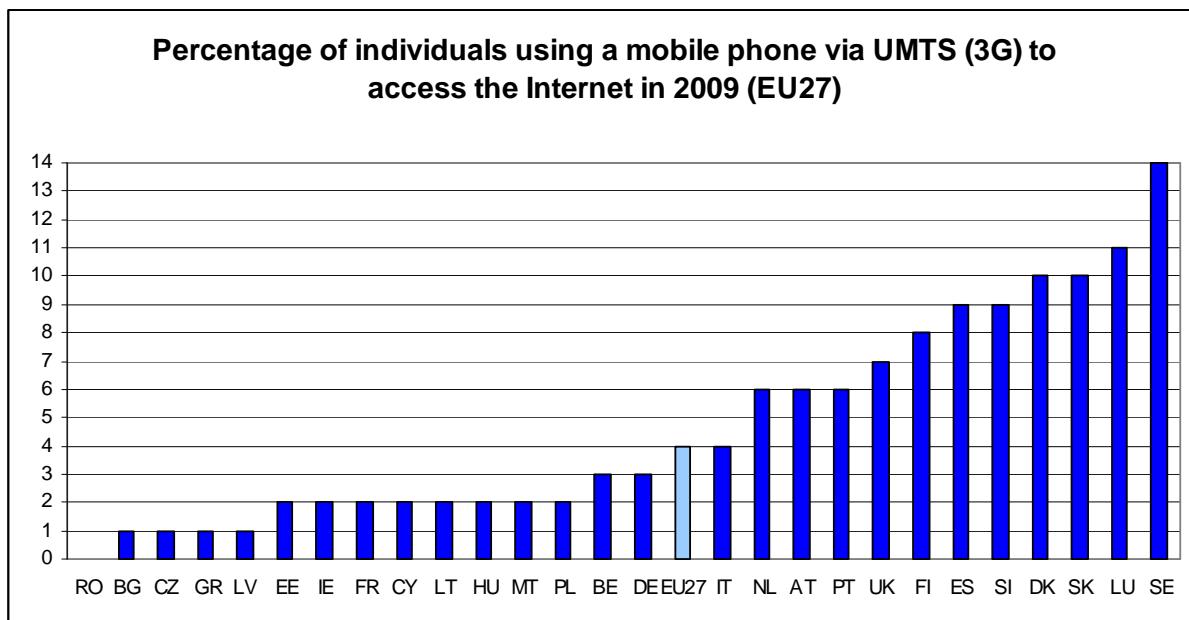
In Figure 14, we can see that creating a web page, which except in the case of purely visual web pages such as pure photoblogs is an exercise in writing, varies by country and by age. While about a fifth of respondents overall were creating web pages specifically to publish their writing or music, only 14% of UK respondents were using their web pages for this purpose while 26% of German respondents were. Age is also notable, with younger respondents more likely to use their web pages to publish writing or music (24%) than the oldest respondents over 50 (16%).

In addition to the sectoral subdomains discussed in this section, there are several horizontal aspects that cut across this domain, and we will now turn our attention to these: the convergence of technologies, professional domains, and generational changes.

3.2 Convergence of technologies

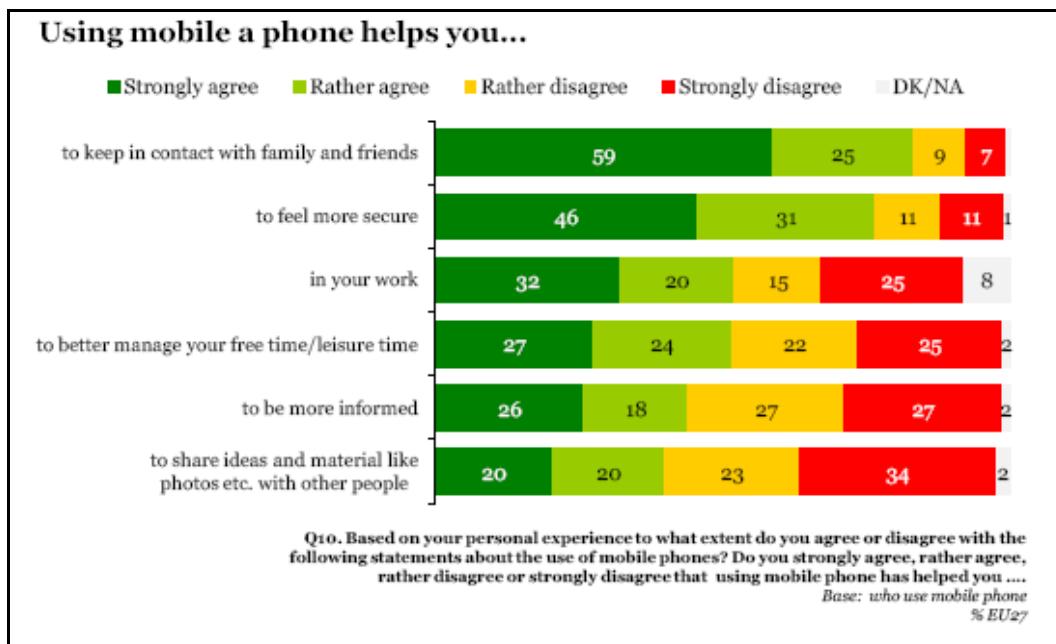
Mobile phones are quickly becoming convergence technologies, combining their initial communicative potential with additional features such as cameras, video cameras, GPS locators, and thousands of small applications, particularly for models such as the Apple iPhone. According to the European Commission, “ownership of mobile phones across the world by 2010 is forecast to reach 3 billion and in Europe, almost 100% of people in the 16-24 age group have a mobile device” (European Commission, 2009b). Apple’s iPhones and iPods have made possible to short-circuit the need for expertise in many ways since now you can buy small pieces of software that allow you to modify the photos without having any computer skill and upload them to the Web. For the first time in history, a single device is capable of producing, processing and sharing images (Cruz & Meyer, Working paper).

Figure 15: Technology convergance and mobile Internet access



Source: Eurostat data on internet usage in households and by individuals

In the Eurostat data shown in Figure 15, we see that there is considerable variation in the extent to which Internet access is converging with mobile devices. Although the overall rate is still low (approximately 3% across Europe). However, these uses appear to be growing, and are worth watching for evidence of whether always-available connections increase the likelihood of European citizens creating content “on the fly” as they move through the real world while connected to the online world. For instance, Figure 16 shows that 40% of Europeans agreed that mobile phone helped to share ideas and materials like photos with other people.

Figure 16: Mobile phone use, 2008

Source: The Gallup Organization (2008, p. 55); Data source: Flash Eurobarometer 241

The commission has also recognized that technologies and content are converging, as reflected in the recent paper reflecting “on the challenge of creating a European Digital Single Market for creative content like books, music, films or video games. According to Commission studies, a truly Single Market without borders for Creative Online Content could allow retail revenues of the creative content sector to quadruple if clear and consumer-friendly measures are taken by industry and public authorities”.¹⁴

3.3 Professional domains

While professional content creators are not the main focus of this report due to space considerations, it is important to note that there have been considerable changes related to in many professional creative industries, including graphic arts (Lupton, 1996), web design (Kotamraju, 2002), fashion (Bollier & Racine, 2005), and architecture (Kolarevic, 2003).

According to Abadie et al., Europe has “a highly creative content sector responsible for the production of a broad range of high quality goods whose competitiveness, especially compared to global mass media conglomerates, is hampered by the difficulties they face in reaching sufficient scale and scope as a consequence of the linguistic and cultural fragmentation of the European market. Smaller actors also find important barriers in their access to markets as a consequence of distribution bottlenecks and the growing consolidation of the retail sector” (Abadie, et al., 2008).

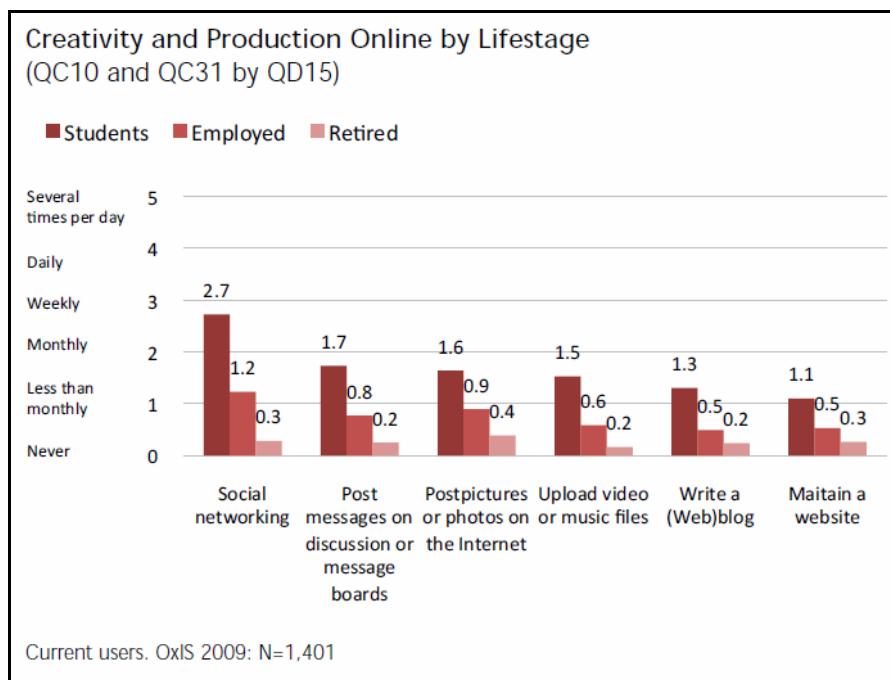
3.4 Generational changes

One of the oft repeated claims is that the current generation of young people, the so-called **digital natives, are much more engaged with ICTs** as a result of having grown up in an electronics- and media-saturated world. And certainly, evidence suggests that this is true.

¹⁴<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1563&format=HTML&aged=0&language=EN&guiLanguage=en>

According to research from the Pew Internet study (which relies on American data), “57% of online teens have created some kind of content for the internet” (Lenhart, 2007; Lenhart & Madden, 2005). The so-called digital natives who have grown up with technology surrounding them do appear to be behaving in ways that indicate they are currently creating content. For instance, in the OxIS report data shown in Figure 17, we can see that **students are much more likely to post materials online than their older counterparts**, with about double the activity in each of the categories reported when compared with employed adults.

Figure 17: Creativity by Lifestage



Source: Dutton, Helsper & Gerber (2009)

One question that lingers is whether these proclivities will follow them throughout life and they will continue to create content as they age, or whether this is an effect of youth itself. If this effect is lasting, we should see large increases in creativity and content creation with new generations of digital natives aging into adulthood and becoming active, creative citizens. Of course, the downside from the point of view of content creators is that many have noted tendency that the **younger generations are generally not willing to pay for online content**, as they have grown up expecting all content to be free. This may require a shift in approach by many content creating industries in the future, and will require new models for the protection of content by both business experts and policy makers.

4 Social impacts analysis

In this section, we will discuss the common themes and questions that have been identified in the conceptual framework for this report.

4.1 Rationalization

Rationalization has played less of a role in the area of creativity and distributed innovation than in other domains where efficiency is considered a key criteria. However, one area of particular interest in this area is the **blurring of the amateur – professional boundary**. In a number of the subdomains identified above, there have been shifts, tensions and changing relationships between professional and amateur producers of creative content. The extent to

which this has allowed amateurs to professionalize their output, and possibly to begin to earn income from their creative activity as a result, has also been shown to potentially threaten the ability of existing professional outlets to continue to earn income from their activities.

It would be misleading to assume user creations are amateurish per se. Actually the popular so-called Web 2.0 application should be perceived as “infrastructures for whatever” lowering the bar to user participation by providing even more simple and easier to use interfaces as those serving the exactly same activities before the advent of YouTube, MySpace, Facebook, Blogger etc. The blurring of professional and amateur users becomes very visible in the presence of commercial TV stations as MTV, or established institutions such as the Museum for Modern Art (MoMa) on YouTube. Also the Dutch institute for Image and Sound (Beeld en Geluid) as well as the Dutch TV station VPRO are only two among many other institutional players hosting a YouTube channel. Two specific examples come from the music industry and stock photography industry.

MySpace has proven to be a boon for musicians in a variety of situations: bands interested in expanding their fan base, bands wanting to get a start, musicians hoping to market their material by building a market outside the traditional distribution channels, and musicians wanting to communicate with their existing fans. This new channel for distribution of music came at a time when music production had been consolidating for decades, with production centralized into the hands of major labels and distribution done mainly by large chain music stores. These channels were built on economies of scale that was heavily biased in favour of the few acts that could sell large numbers of singles and albums. The long tail (Anderson, 2006) of music, that which appealed to much smaller audiences, was largely frozen out in this model. Beyond the ability of club acts to break out into a larger market, such as the Britpop phenomenon of the early 1990s, non-mainstream music had difficulty accessing anything other than local markets. MySpace, however, eliminated most of the cost associated with accessing a distribution channel. By posting a profile and a batch of audio files, a band could provide potential fans with a way to hear and sample their music. This disintermediation of the music distribution process means that those bands in the long tail, those which are unlikely to ever fill Wembley Stadium, could nevertheless start to reach growing audiences and as a result, sell more tickets and CDs.

Photographers have been sharing millions of photographs online, increasingly distributed under Creative Commons licenses that allow for sharing, re-mixing and re-use for non-commercial purposes. Before the availability of services such as Flickr and Fotolog, however, very little high-quality photography was available to the SME or individual who wanted a photograph as an illustration. Much of the activity in this area was then centred at stock photography companies, that would sell photographs for re-use. With the advent of **Creative Commons sharable photographs and microstock websites**, however, there was suddenly a **huge supply of photographs available to anyone with an Internet connection**. This sudden increase in supply without a comparable increase in commercial demand led huge price cuts at Getty and Corbis, the world's largest stock photography companies. A new creative opportunity, however, now exists for photographers throughout Europe and elsewhere in the world: marketing their photographs through microstock agencies.

Both these examples demonstrate the blurring boundary between amateur and professional artists. There are signs that increasing numbers of domains have seen ICTs enabling growing numbers of participants who are engaged in what Stebbins (1992) calls **serious leisure**. In this notion, participants in a domain who are deeply engaged in a set of activities, belong to a unique ethos and social world, and have a social identity connected to the activities beyond that associated with a casual amateur may be engaged in serious leisure. ICTs such as MySpace and Flickr are **enabling more people to transition from pure amateur to hobbyist/volunteer roles** marked by these serious leisure characteristics, **and a small number to further transition to more professional roles** in a subdomain. While this is somewhat different than the sorts of rationalization discussed in professional or

managerial organizations, it is nevertheless still a form of rationalization in the sense that it **promotes professionalism**, and a bias towards effectiveness if not efficiency per se.

There are clear limitations to the terms amateur and professional in respect to media use. An example highlighting the ambiguity of the term are musicians, who can produce music from a professional mindset and quality but still not qualify for the annual royalty payments distributed to approximately only 25% of all recording artists. Or programmers with 9-to-5 day jobs can still work in a professional manner for their favourite open source project, develop game levels for online games or engage actively in lobbying against software patents. Beyond the established channels of the culture industry one can find dynamic and very active domains of cultural production, such as the Netlabel scene, the demo scene, software development, and a wide range of initiatives providing access to public domain texts, etc.

The term user, amateur and especially our understanding of labour has to be revisited in view of the unfolding media practice. It is important to understand that there are people doing labour-like things without getting paid for it, and without particularly caring that they are not being paid for their labour.

4.2 Networking and Social Capital

When considering the extent to which the creative domain is already networked, the answer is highly variable. In this section, we will discuss the extent to which those subdomains that are increasingly networked (music, photography, writing and information sharing, video) are seeing major changes in the organizational structures supporting the subdomain.

For at least some portions of this domain, one could argue that a **critical mass of online connectivity has already been reached**. This domain is quite interesting, however, because even though it is involved with creating outputs, in terms of technology itself it is largely a consumer of off-the-shelf applications bent towards particular creative uses. Relatively little software or network infrastructure has been built specifically to support this domain, but there are numerous examples of existing software and network infrastructure being tweaked, re-purposed, and enrolled into new uses. This re-purposing, of course, is itself a form of creativity.

The issue of social capital is **clearly demonstrated in this domain, although many participants would likely have difficulty with the notion that expressing creativity is necessarily increasing their social capital**. This is due in part to the fact that most personal payoffs from the expression of creativity are indirect. Unlike domains where high social capital can be translated into making money or finding treatments for disease, having a popular blog that is written for free and given away for free has fewer concrete rewards.

The ties that predominate in this domain are likely those representing **bridging capital**, building weak ties of similar but distant people. A shared interest in a band, an author, or a style of photography are not the strong ties that create bonds that can be relied upon in different settings, but ICTs do allow people with these shared interests to connect in ways that would not have been possible otherwise. In particular bridging capital due in part to the availability of ICTs has led to more social cohesion among people with shared creative interests. In particular, according to the Flash Eurobarometer 241 data, 70% of Internet users reported that the Internet has had a positive impact on their ability to share views and access culture (see Figure 10).

4.3 Empowerment and Participation

Recent developments of Web 2.0 applications on the Internet have greatly enhanced the ability of citizens of Europe and elsewhere to participate in the creation of content and ideas for public consumption and discussion. This has been somewhat of a surprise, particularly in light of some arguments in the late 1990s that came out of the digital divide debate. In short, it was suggested that even if countries were able to lessen the digital divide in terms of

access to technology, there would still be a strong divide between those who had the skills and resources needed to create content and those who remained passive consumers. Barriers to creating content were relatively high at the time: designing a web page required knowledge of HTML coding and access to hosting services, and bandwidth was relatively expensive so a popular site could quickly become unaffordable. **Web 2.0 services, on the other hand, allow users to create blogs, photo sharing pages, music sites, and any number of other complex contributions to the Web with no knowledge of obscure technical codes.** As a result, we have seen participation in the creation of content growing rapidly.

One of the precursors for advancing participation in digital creation is widespread, fast connections to the Internet. According to Vivianne Reding (EU Commissioner for Telecoms and Media Digital Europe):

The "first movers" in Europe have already started implementing these targets: The French government, with its plan France Numérique 2012, is pursuing the objective to equip all French households with an internet connection of at least 512 Kbit/s by the end of 2012. In the UK, Lord Carter told us, in his ambitious Digital Britain report, that the government sets the objective to serve all British households by broadband networks of at least 2 Mbit/s by the end of 2012, eased by the creation of a Next Generation Fund. In Germany, the federal government, in its Breitbandstrategie, calls for connections of 50 Mbit/s to serve 75% of the population by 2014. Finland has even committed to a universal broadband service at 100 Mbit/s. These are examples of countries who got their priorities right. They all have recognised the need for boosting the digital economy. (Reding, 2009, p. 5)

Once these basic infrastructural changes have been adopted in a society however, there are now plenty of easy-to-use and free-to-use online applications that support the expression of creativity that relatively few barriers remain in certain domains such as writing, photography, and video creation.

4.4 Education and Lifelong Learning

Learning in the creativity domain is largely informal, and the result of either self-teaching or peer-to-peer support. This theme of informality is also one of the elements of this domain that make it particularly potentially valuable for engagement of adults in lifelong learning. Within the creativity domain, as we have seen above, the sharp divisions between amateurs and professionals are blurring, which in turn allows for serious amateurs with aspirations to be able to contribute to the growth in user-generated creative output.

Informal learning clearly occurs in this domain, as peer-to-peer networking has allowed a flowering of creative opportunities. People commenting on each other's blog posts, photographs, and videos support the creative process and in turn have led to enhanced personal development.

4.5 Discussion

In some ways, as mentioned above, this domain has been more resistant to ICTs than others, so scenarios in which ICTs did not develop are reasonably easy to imagine. Several questions arise when thinking about alternative non-ICT scenarios for the present and future.

First, for those subdomains which have become heavily engaged with ICTs, would there have been much less public engagement with the subdomain overall without the ICTs? In some cases, the answer seems to be clearly yes. **For photography, public writing, and public performance of music, ICTs have helped usher in a huge amount of new content.** It is not an exaggeration to say that the changes have been quite influential in these subdomains.

Secondly, for those subdomains which have largely not engaged with ICTs, what are the common features that have contributed to this lack of engagement, and what will be the consequences (positive or negative) if the subdomain continues to stay unengaged? Are there costs for disengagement? Are there sound reasons for avoiding entanglement with ICTs? In the cases we have mentioned above, such as **classical music, theatre, opera, performance art and other performance based forms of creativity, the very physical and performative aspect seems to be a major barrier to moving the activity online.** This seems very rational, particularly as live theatre did not disappear when television came along; why would one expect it to disappear when tiny little 5cm videos that are limited to 10-minute clips come along? Likewise, albums and CDs did not stop orchestras from performing (nor, for that matter, did it lessen the interest in seeing live performances by recording artists, who still tour to perform for audiences).

This is **not to suggest that those engaged in the forms of creativity less expressed via ICTs are not engaged with ICTs in other ways.** Orchestra musicians may still play violins made of wood and lacquer, but they receive notices of upcoming gigs via their iPhones, mobiles and Blackberries, and if they are not available when the gig phones, the job may go to the next musician on the list. Actors who work in live theatre are not luddites, but have simply no reason to change their ways of expressing creativity just because computers and the Internet have become ubiquitous. Of course, their theatres have websites, and tickets to their performances are sold via online retailers, and their performances will be reviewed both by mainstream and alternative media outlets such as fan forums set up on the Internet. But, at the end of the day, they will still walk out onto a wooden stage and speak words that are meant to move their audiences, who are sitting in the dark in that same theatre.

5 Conclusions and Policy Implications

There is a high likelihood that the **act of producing creative content will continue to get easier**, lowering the technical barriers to creating output. While it would be an overstatement to argue that this alone would likely lead to a flowering of creativity across Europe and the rest of the world, it is reasonable to expect to see additional novel applications and infrastructures spring up to support new kinds of creativity online and offline but enabled by ICTs. **The production of creative content will never become a focus of the majority of population, but increasing numbers of young people will grow up thinking that generating creative content is a normal activity,** that then contributes to their being a more well-rounded citizen who is also more likely to engage in the consumption of cultural and artistic opportunities throughout their lives, even if they no longer engage in creating these sorts of outputs themselves.

Creativity unfolds because computers are meta-media emulating all other media, because software is changeable and because digitized artefacts can easily be copied and distributed. That is the new world of cultural production. Business models based on the control of mechanically reproduced artefacts will be forced to change and adapt to the new paradigms

of production. Efforts such as the manifesto¹⁵ circulated around European forums and various Free Culture events¹⁶ **defending re-mix and sharing culture** and attacking cultural industries, if they are taken seriously, must be taken into consideration when considering policies that balance the needs of artists both large and small and various types of consumers.

5.1 Lowering Barriers

There is a high likelihood that the act of producing creative content will **continue to get easier**, as the technical barriers to creating output drop further with the creation of new technologies for creating and sharing content. While it would be an overstatement to argue that this alone would likely lead to a flowering of creativity across Europe and the rest of the world, it is reasonable to expect that we will see additional novel applications and infrastructures spring up to support new kinds of creativity online and offline that are enabled by ICTs. While it would be naive to argue that the production of creative content will ever become a focus of the majority of population, nevertheless increasing numbers of young people will grow up thinking that generating creative content is a normal activity. This view then will contribute to their being more well-rounded citizens who are also more likely to engage in the consumption of cultural and artistic opportunities throughout their lives.

5.2 Blurring boundaries between amateurs and professionals

There are limitations to the terms amateur and professional in respect to media use. While many musicians produce music of professional quality, they still do not qualify for the annual royalty payments distributed to approximately only 25% of all recording artists. Programmers with 9-to-5 day jobs can still work in a professional fashion on their favourite open source project, developing levels for online games or lobbying against software patents.

There are signs that creative expression via ICTs is enabling growing numbers of participants who are engaged in "**serious leisure**". Participants who are deeply engaged in a set of activities, belong to a unique ethos and social world, and have a social identity connected to the activities beyond that associated with a casual amateur may be engaged in serious leisure. ICTs such as MySpace and Flickr are enabling more people to transition from pure amateur to hobbyist/volunteer roles marked by these serious leisure characteristics, and a small number to further transition to more professional roles in a subdomain.

5.3 Users, amateurs, and labour

Related to the blurring boundaries between amateurs and professionals are changing understandings of the terms "user", "amateur" and especially our understanding of labour, which has to be revisited in view of unfolding media practices. Increasingly, there are people doing activities that have all the signs of labour activities, except for the fact that the participants do not get paid for their work. Furthermore, these **volunteer workers** are not particularly bothered by the fact that there were not remunerated financially, although they may gain other less direct benefits such as increased social standing, an enhanced sense of self-control and self-respect, and thus an increased social efficacy in general. Whether this increasing efficacy later transforms into enhanced economic and political capital and power remains to be seen, but is a real possibility.

¹⁵ <http://exgae.net/exgae-multiply-and-share-forth/theoxcars/manifestoenglish>

¹⁶ <http://oxcars09.exgae.net/?lang=en>

5.4 Engaging citizens

Policy regarding creativity must tread a fine line between providing **adequate support** for creativity and cultural institutions, and **stepping out of the way** of those wishing to engage in creative expression by lowering barriers and allowing creativity to flower. While there have been efforts to address arts policy in Europe (Cliche & Wiesgand, 2007), this has not by and large addressed the role that ICTs play, or should play, in arts policy. Many activities of creative expression and innovation on the Internet are still seen as peripheral in terms of development activities. However, additional attention in this area has the potential to pay dividends in terms of a more engaged citizenry who feel empowered to express themselves in the public forum of the Internet.

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[H] Social Impacts of ICT: Comparison between Europe and other parts of the world

Empirica

Karsten Gareis

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0 Executive Summary

While the core of research in the context of the “Social Impacts of ICT” study was limited to collecting evidence which relates to the situation in Europe, a complementary analysis was carried out to identify, as far as available evidence allows, the main peculiarities in the social impacts of ICT in other parts of the world, namely the United States, Canada and Australia, Japan and the Republic of Korea, in comparison to the situation in the European Union.

Very little comparative research is available on differences in social impacts of ICT across countries, apart from statistical data on take-up rates and the activities for which people use the Internet, mobile phones and related ICTs.

The 2009 version of the ITU ICT Development Index ranks Korea second, outperformed only by Sweden, and ahead of other EU frontrunners such as Denmark (3rd), the Netherlands (4th), Luxembourg (7th) and Finland (9th). Japan is on rank 12, Australia on rank 14, the USA on rank 17 and Canada on rank 19. A major reason for the low ranking of both countries is their modest performance in terms of spread of mobile telephony in general, and mobile broadband, in particular. The EU countries which rank lowest are Bulgaria (45th) and Romania (46th), the Member States with by far the lowest GDP per capita.

Actually, many of the early findings on the social impact of the Internet were based on research carried out in North America, which is the most advanced not necessarily in rates of uptake, but in the development of new services and applications for “social uses” of the Internet. This implies the danger that research findings from the USA are considered to be fully applicable to other advanced capitalist countries, which would ignore the extent to which there are important cultural differences between US Americans and, for example, Europeans. Examples include the longer distances and greater physical mobility of North Americans, which often make face-to-face social interaction all but impossible, and the much more liberal attitude with regard to data privacy in the private economy.

In both Korea and Japan, development of ICT infrastructure and applications has been rapid in recent years, especially in the area of mobile (personal) communication technology and broadband (fibre-to-the-building). Strong public investment in ICT is mainly seen as necessary for economic development, whereas applications for strengthening civil society are rarer. In the social domain, plans for deployment of ICT (e.g. ubiquitous computing) for addressing current challenges are ambitious, but it appears that they are too much guided by technological determinism, without taking proper account of the implementation contexts. For example, ICT-based remote work has been strongly promoted by the Japanese government as well as some employers, but in practice take-up is low, arguably because working cultures continue to rely on face-to-face interaction. On the other hand, ICTs have been taken up enthusiastically where they allow the nurturing of social ties, especially among tight-knit groups of people such as families and friends. The autonomy afforded by the mobile phone, for instance, is being perceived as strongly empowering especially by individuals who used to suffer from strong social control, i.e. the youth and also, to some extent, women.

The main findings with regard to the social impacts of ICT in non-European, developed nations can be summarised as follows:

- With regard to **participation of policy-making**, there has been a number of incidences where instant, hard-to-control communication through the Internet and/or mobile telephony has been of vital importance for enabling spontaneous collective action, e.g. in the context of counter-oppressive activities. In particular in countries with limited degree of press freedom, personal ICTs have also been instrumental for grassroot movements. There has been hardly any evidence, however, of eParticipation having a significant influence on the formal policy-making process, at least until the successful presidential campaign of Barack Obama in 2008, which

according to Manuel Castells (2009, p. 392) "surpassed every major political campaign in the use of the Internet as a political mobilization tool both in the US and in the world at large".

- In the field of **education and lifelong learning**, the positive effect of the Internet on people's ability to learn is widely perceived as a major benefit of online access. Of course, students experience the resulting benefits more directly than people who have already finished initial education, but the more significant impact for the larger society is likely to be the effect on people's engagement in lifelong learning. The greater interactivity of online interaction means that informal learning as a lifelong project has become much easier to engage in. On the other hand, there are no robust signs, from either Asia, North America, Australia or Europe that eLearning in the sense of structured learning without which does away with all face-to-face interaction between teaching staff and learners is replacing more traditional types of learning.
- In the **work** domain, ICTs have greatly enabled new ways of working which should come to the benefit of both workers and employers. But while most observers believed that remote work and other types of ICT-based flexible work would spread widely within a short period of time, actual rates of take-up have remained modest. Countries such as Japan which support telework as a means to achieve social and economic progress found that existing organisational cultures, as well as other deeply embedded social practices, have acted as barriers to change. At the same time, the rapid penetration of ICTs in working life, while increasing work flexibility, implies the danger that existing boundaries between work and private life are being eroded. In fact, a large share of workers who make heavy use of ICTs perceive potentially negative impacts of this kind, in all countries for which data are available.
- In the **consumption** domain, online shopping has taken off fastest and reached the highest rates of penetration in countries with a strong tradition in widespread use of mail order commerce, which includes the USA as well as some European countries, such as Germany. Still, online shopping continues to be concentrated along particular product categories, and a relatively small group of consumers accounts for a large share of online order value. One aspect in which consumers both from Japan and Korea differ strikingly from European consumers is in their faster acceptance of online delivery of media products which used to be distributed in physical format (e.g. CDs, DVDs, books). Much of the market in both countries is driven by downloads to mobile end devices. Mobile music downloads now account for over 90% of all recorded digital music revenue in Japan, compared to 29% for the UK.
- In the **health** domain, use of the Internet for looking for health-related purposes is one of the most common online activities, and is also a frequently mentioned reason for acquiring access to the Internet in the first place, especially among women. Evidence from the USA and Canada, which are among the most advanced in this respect, suggests that the Internet is effective in helping people deal with the uncertainty introduced by health care problems. This has resulted, at least, in perceptions of improvement in health care experiences for people. In general, searching health-related information appears to be one of the main activities which is associated with the process of the Internet becoming firmly integrated in people's daily lives.
- With regard to impacts in the area of **community and family**, the consensus among social researchers across the world is that the Internet enhances social connectivity in a variety of ways, mainly by making it easier to maintain connections to family and friends regardless of distance, and by helping to find and engage in tailored communication with people who share similar interests. Empirical evidence from interview surveys suggest, however, that there might be some areas of life where increasing online activity means fewer contacts with others. This applies, for example,

to social exchange around religious beliefs. There is also some evidence according to which the increase in communication and “perpetual contact”, heavily supported by personal communication technology such as mobile phones and PDAs, contributes mainly to interaction in tight-knit groups of like-minded people, while casual, unplanned contact with people who do not belong to the peer group, i.e. who are “different”, might suffer. Most of the related research stems from Japan, where people have taken much more enthusiastically to mobile data services than in Europe or Northern America.

- In the domain of **creation and distributed innovation**, there is a lot of evidence which supports the assumption that the Internet and, in particular, Web 2.0 applications have made a real difference for all those people who feel the urge to be creative and to socialise around their leisure pursuits with others who share similar interests. Moreover, there appear to be sizeable national differences in the take-up and usage patterns of different types of applications for user-created content. Blogging is comparatively widespread in Asia, particularly in the Republic of Korea, while Internet users in the USA, Canada, Australia and Europe are more likely to prefer other ways of exchanging user-created content.

Across the countries surveyed in the present report, it appears that ICTs are not endangering national cultural differences; rather, the ways in which ICTs are being integrated in the way people live and work – in families, various types of communities and society at large – tend to **reinforce social practices**. This can be seen, for example, in the different ways in which people in different countries use the Internet, mobile phones and other ICT to deal with the challenges arising from living in an often alienated society facing rapid technological and economic modernisation.

1 Introduction

The objective of the Horizontal Domain Report is to compare developments concerning social uses of ICT and their social impacts between Europe and selected other parts of the world. By the very nature of the enterprise, our analysis needs to be selective, i.e. we will **not** attempt a comprehensive overview of social uses of ICT, and their effects on the people concerned, across all types of countries and regions in the world. Instead, the domain report will highlight selected examples from countries which in some respect differ from the EU mainstream, but from developments in which important insights can be gathered in relation to ICTs' potential social impact and the policy implications which these may have. The special emphasis will be on developments in two specific areas, firstly **high-speed broadband access to the Internet** (e.g. via "fibre to the curb") and secondly applications of the **mobile Internet**.

The following countries have been selected as the main focus of our analysis: the **United States, Japan, Republic of Korea, Australia and Canada**.

This will allow us to cover experience with mobile applications and high-speed broadband in Asia, as both the Republic of Korea and Japan are very advanced in terms of take-up of both.

The present chapter takes account of the findings from the vertical domain research, which has explored evidence about social impacts of ICT in Europe across the following domains:

- (a) participation in policy-making
- (b) education and lifelong learning
- (c) work
- (d) consumption (including media and entertainment)
- (e) health
- (f) community and family
- (g) creation and distributed innovation.

The present report is to complement the European analysis by exploring to what extent the situation in non-European countries differs from developments within the EU. In order to do so, statistics are used to highlight the relative position of the EU Member States in relation to non-European countries.

Researchers of the social impacts of ICTs need to stay alert of the big variety in the way these technologies are being taken up and integrated in everyday life across the globe. As has been argued powerfully by many scholars, "there is no one model of information society, ultimately represented by the United States and California, that serves as the standard of modernity for the rest of the world. The significance of the Information Age is, precisely, that it is a global, diverse, multicultural reality" (Castells & Himanen, 2002, p. 3). Nevertheless, there are types of national social contexts which show a big similarity (in Europe, a good example is the Nordic countries) and as such allow for a certain degree of generalisation.

The main differences between (groups of) countries in terms of overall economic development stage, ICT uptake and policy approaches towards the role of ICTs in society can, based on van Dijk (2006) and Venturelli (1998, 2002), be described as follows:

- The **USA** is an example of a "liberal market model" with state intervention limited to legal and market regulation for guaranteeing contractual and property rights in the market place. The development of the information society is largely left to the dynamics of the free market, with competitive forces expected to lead to the most efficient and user friendly ICT infrastructure and applications.

- Van Dijk (2006) considers **Canada** to be much more geared towards a “**public interest model**” which aims to balance the interests of citizens/consumers with those of private industry. Market imperfections are being corrected by use of pro-active regulation, e.g. consumer protection policy and universal service obligations. To a lesser extent, the same appears to apply to **Australia**. Both countries show a similarity to the information society policy models prevalent in Europe (Venturelli, 2002).
- In South-East and East Asia, the role of the state in information society development is significantly stronger than in Europe and North America. This applies to the **Republic of Korea**, where large-scale public investments in ICT guided by a comprehensive development strategy based on the establishment of the information society and a strong focus on spending on education have lead to impressive performance with respect to information society indicators (Castells, 1998). As van Dijk (2006, p. 251) observes, in South-East Asian countries (including South-Korea) ICT are mainly being seen as agents of economic development, whereas applications for strengthening civil society are rarer. Individuals’ information and communication freedoms are often curtailed.
- **Japan** shares some of the cultural traditions with its South-East Asian neighbours, but has developed earlier economically, and also has a more firmly established democratic system. The development of the Information society in Japan was also dominated by economic priorities, manifested by the strong role of the Ministry of International Trade and Industry (MITI) and its successor, the Ministry of Economy, Trade, and Industry (METI). However, users have to a stronger extent than elsewhere in Asia been involved in processes of the ‘social construction’ of ICT applications in Japan, especially in their role as consumers.

The Domain Report refers mainly (although not exclusively) to these countries in the presentation of evidence on social impacts of ICTs.

There are, of course, also considerable cultural differences between Asian and European countries. A number of theoretical approaches are available for making sense of these differences (e.g. Hofstede & Hofstede, 2005; Inglehart & Welzel, 2005). Without the possibility to go into any detail, a major difference can be found in the position of the individual vis-à-vis the collective/group, e.g. family, community (Hofstede & Hofstede, 2005, p. 73-114). Because of their more collectivist culture, Asian countries have had a lot of public debate about the effects of ICT use on social cohesion and sociability (Castells et al. 2007; Katz 2006). Pessimistic accounts have zoomed in on the forces which allegedly drive apart families and undermine people’s commitment to the groups they belong to. Optimistic accounts have focused on the potential capability of ICTs to foster social networks while allowing for more individual expression, thereby also increasing accountability and personal freedom. Both are topics which, albeit in a different social context, are much discussed in Europe as well.

We therefore assume that Europe can strongly benefit from the results of research undertaken in Asia, in spite of differences in national culture and in the market and regulatory environment.

Readers should note that indirect impacts of ICTs, i.e. what Sproull & Kiesler (1991) calls “secondary effects of technology”, are not discussed explicitly in the present report. One needs to remember, however, that indirect effects may indeed be the more fundamental ones. ICTs can play an essential role in altering the given social setup of a place, region or countries, for example with regard to parent-children relationships. It is, indeed, “essential to understand and exploit possible catalytic ‘effects’ of ICT. Many important changes in social relations may come from the human interaction that surrounds the technological process

rather than from the operation of computers or use of the Internet" (Warschauer, 2003, p. 212) or, for that matter, the application of mobile phones.

The remainder of this report will be structured as follows:

In chapter 2, some of the key international developments of interest are highlighted. For this purpose the section presents some statistics which show how European countries compare against non-European countries with respect to key information society indicators.

Chapter 3 is structured according to the seven domains used by the study for analysing social impacts of ICT. For each of these domains, we briefly discuss the main evidence about the social uses of ICTs and the direct social impact categories in selected non-European countries.

Chapter 4 contains some conclusions.

Finally, chapter 5 contains the bibliographical references.

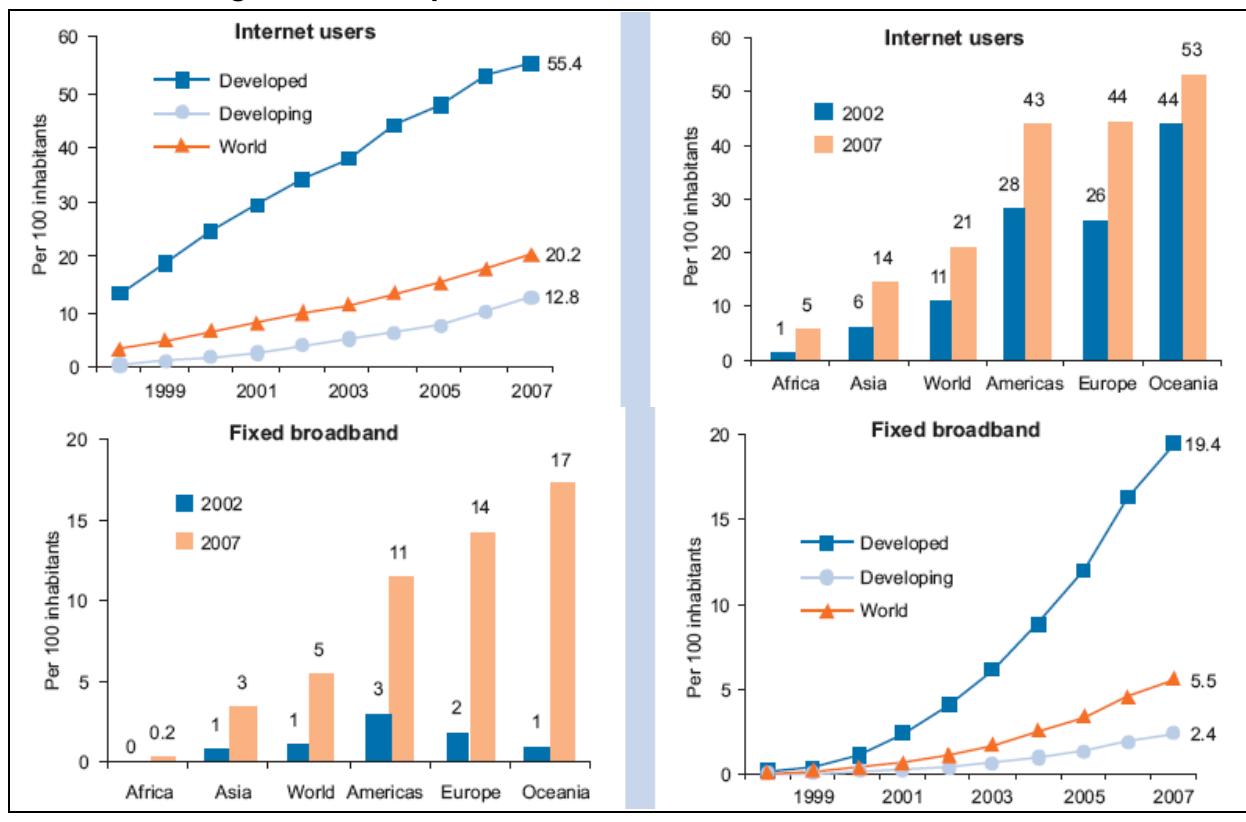
2 Uptake of ICTs: An International Comparison

This chapter of the Domain Report will briefly discuss some of the recent trends in information society development around the world using comparative data, thereby emphasizing the most important differences between Europe and other countries of the world.

2.1 Infrastructure

The last 15 years have seen a rapid increase in the uptake of Internet and, more recently broadband Internet across the world. As Figure 1 shows, rates of uptake are much higher among developed countries, but growth rates have been considerable in the developing world as well.

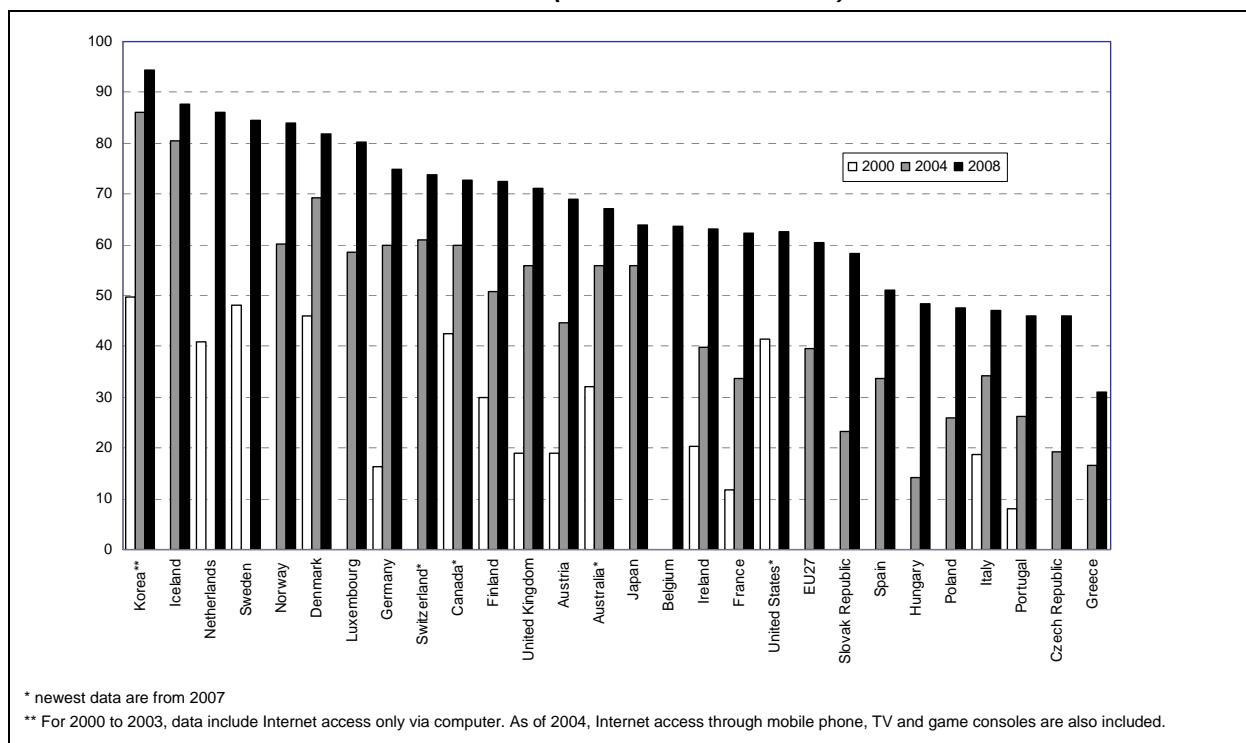
Figure 1: Development of Internet and fixed broadband users



Source: ITU (2009, p. 5)

Between 2000 and 2008, the percentage of households with access to the Internet has increased substantially across all OECD countries, as Figure 2 shows. The highest rate of uptake is to be found in **Korea**, which is a spectacular achievement when considering that the country's GDP per head is still below the OECD and EU27 averages. Next up are the Netherlands, Scandinavia and Luxembourg, all of which had reached 80% of penetration already in 2008. **Canada** belongs in the next group (70%-75%) together with Germany, Finland, Switzerland and the UK. At the other end of the ranking a number of South-European and East-European Member States with less than 50% of uptake in 2008 can be found (Italy, Portugal, the Czech Republic and Greece). **Australia, Japan and the USA** have figures only slightly above the EU27 average. The figure also shows that growth rates have been particularly high in some (but not all) of the countries with below-average rates of uptake, including the OECD member countries from East Europe.

Figure 2: Households with access to the Internet 2000-2008 in selected OECD countries (% of all households)



Source: OECD (2009)

With regard to broadband Internet, the latest data from the OECD (Figure 3, Figure 4) suggest that the forerunner countries within the EU (the Nordic Member States plus the Netherlands), also represent the leaders on the international rank tables, together with Norway, Switzerland, Iceland and Korea. Both **Japan** and **Korea** stand out as they have very high shares of broadband users who avail of high-speed connections, e.g. via fibre-to-the-building – in Japan, almost every second broadband Internet user has access to such a high-speed connection.

Figure 3: Broadband uptake in OECD countries, June 2009

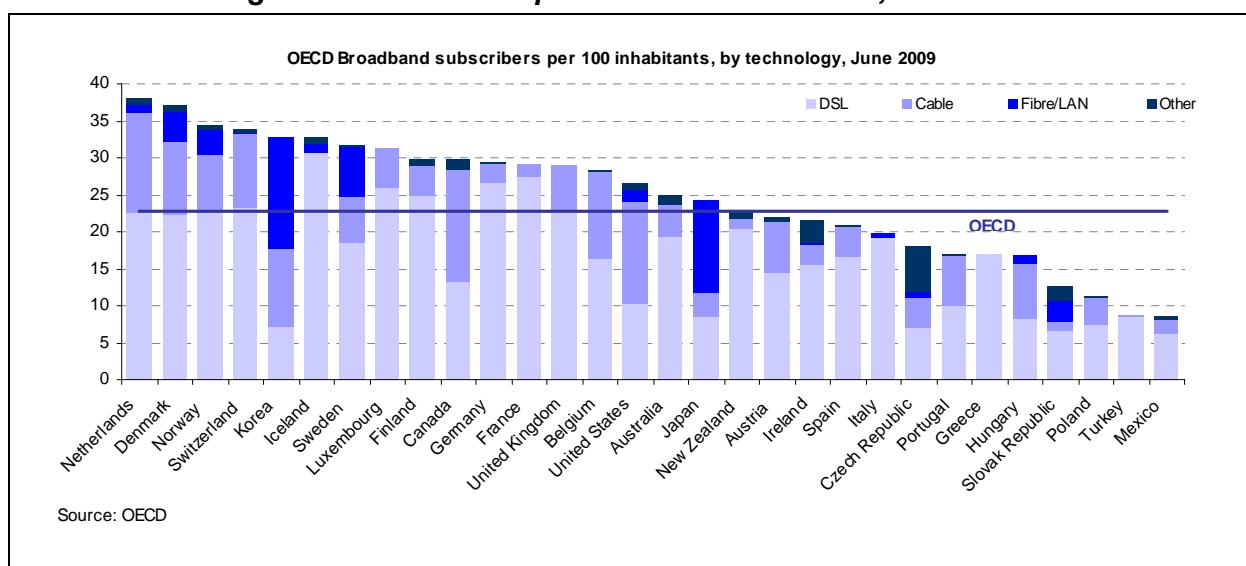
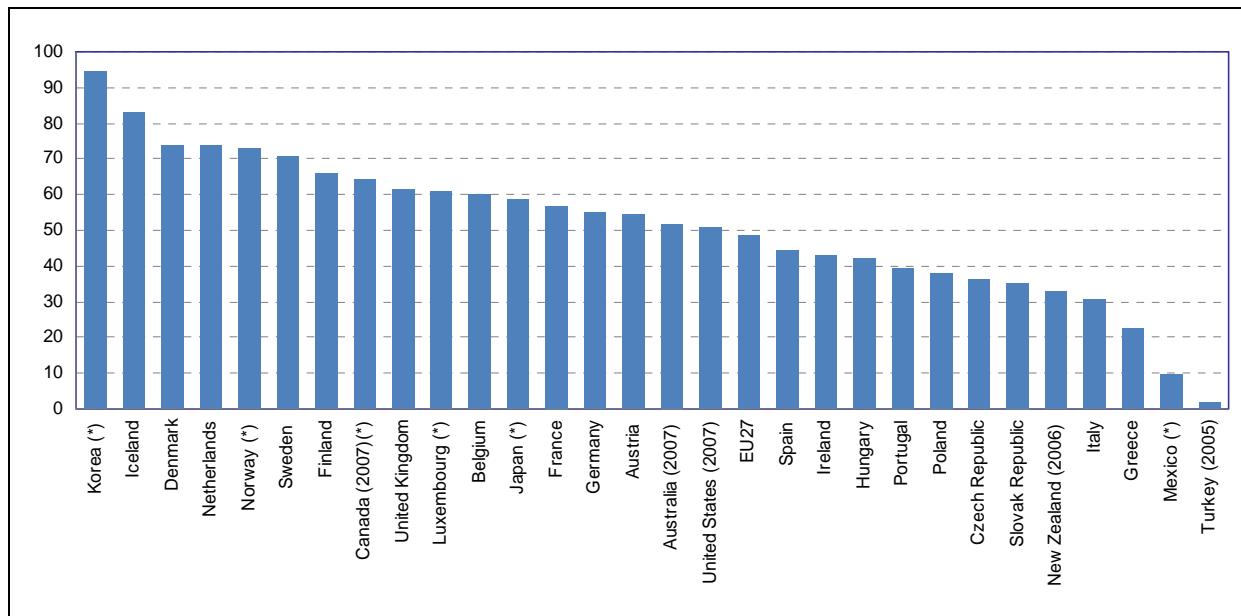


Figure 4: Households with broadband access in OECD countries, 2008

Source: OECD, 2010 (online database)

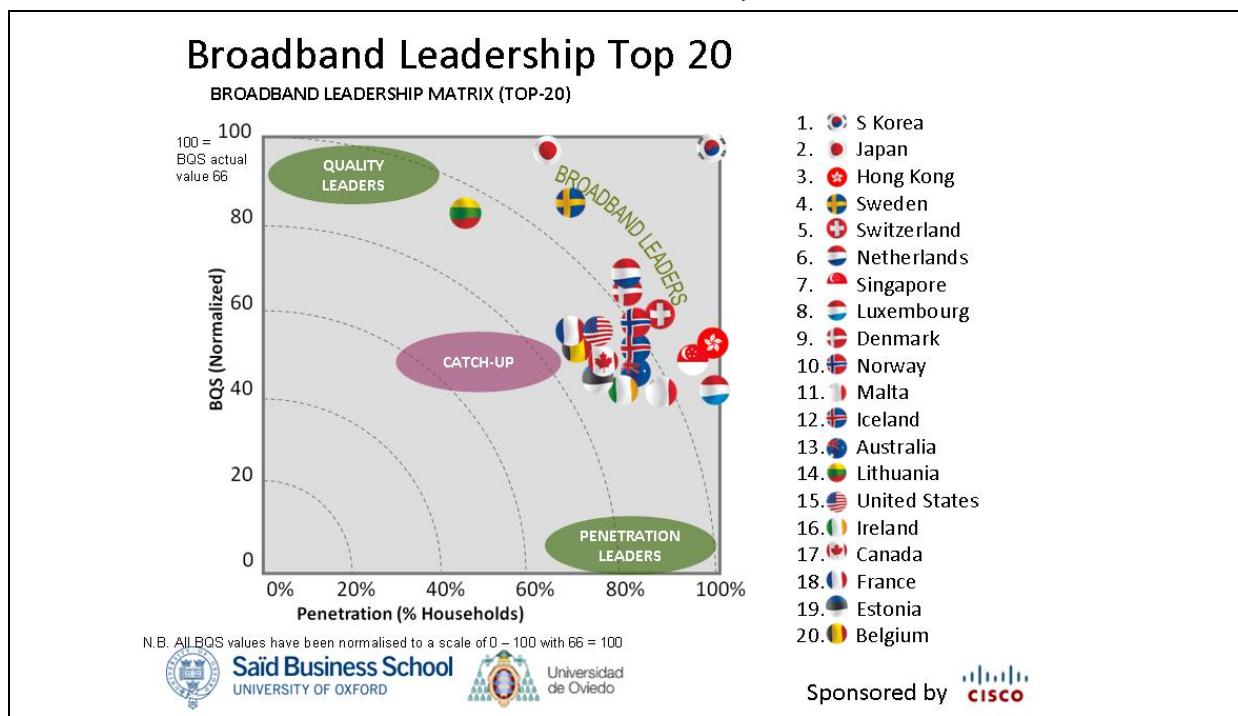
Non-European countries with rates of broadband uptake above the OECD average also include **Canada**, **Australia** and the **USA**.

Research into the quality of broadband Internet access has shown that there are sizeable differences between countries in the bandwidth which users can actually avail of. Using millions of records from actual broadband speed tests conducted by users around the world from May to July 2009¹, Fu et al. (2009) calculated statistical averages for each country of several key performance parameters used to determine the quality of a broadband connection, including average download throughput, average upload throughput and average latency (see Figure 5). The analysis showed that South Korea is ahead of the game in both penetration and broadband quality score. Japan also has outstanding broadband quality, but somewhat lower penetration. Other countries with high broadband quality score include Sweden and Lithuania.

Many observers have suggested that the **switch from narrowband to broadband** access is associated with an expanding range of activities carried out online and with more time spent online. Qualitative studies suggest that the switch to broadband has enabled new, formerly impractical or impossible applications of the Internet, including social popular networking services, exchange of user-created content, IP-based telephony and videophony, and advanced media services such as video-on-demand. The switch to broadband usually went hand-in-hand with a change from metered access to flat-rate access, which has been the driving force behind the spread of “always on” connection (Horrigan & Rainie, 2002).

¹ Tests conducted through www.speedtest.net

Figure 5: Broadband quality against broadband penetration in the leading broadband countries of the world, 2009



Source: Fu et al. (2009, p. 4)

Indeed, one of the most important effects related to the shift to broadband access appears to be the emergence of the “participative web” and the explosion of user-created content and social networking on the Internet, all of which have been subsumed under the term “Web 2.0” (OECD, 2007a). John B. Horrigan (2008a), associate director at the Pew Internet and American Life Project, summarised the “defining behavioral difference” related to broadband as follows:

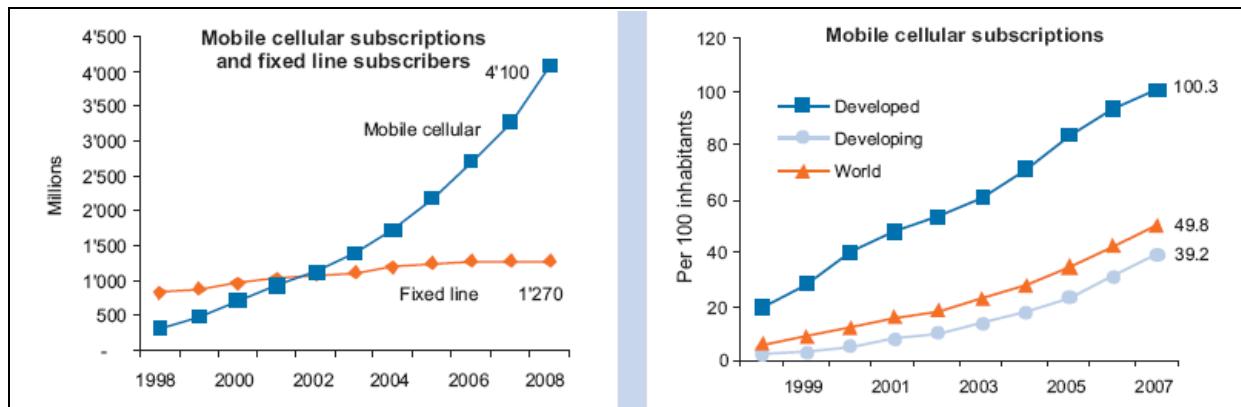
(...) Broadband users are far more likely than dial-up internet users to create or post content to the internet. [...] As home broadband adoption grew [in the US], posting and creating content for the internet became more widespread. The Pew Internet Project reported in a 2006 survey that 44% of home broadband users had done at least one of the following activities that involve user-generated content: having one's own blog or webpage, working on group blogs or webpages, remixing digital content and re-posting it online, or sharing something online created by the user (i.e., artwork, photos, stories, or videos). [...] User-generated content has shaped broad expectations about the primary purpose and uses of cyberspace. [...]

The fuss about broadband, then, extends beyond access to information to active participation in the online commons as people with shared interests or problems gather at various online forums to chat or collaborate. Yochai Benkler has argued forcefully that the magnitude of non-market production enabled by cheaper computers and abundant bandwidth is important and significant to such things software development and Wikipedia. In a similar vein, Terry Fisher of Harvard’s Berkman Center for Internet & Society points to the resurgence of amateurism in the production of culture, something fostered by digital technology and information networks. While inherently difficult to measure, these kinds of social and cultural capital are important elements in ongoing debates about the uses and consequences of broadband access.

2.2 Mobile networks

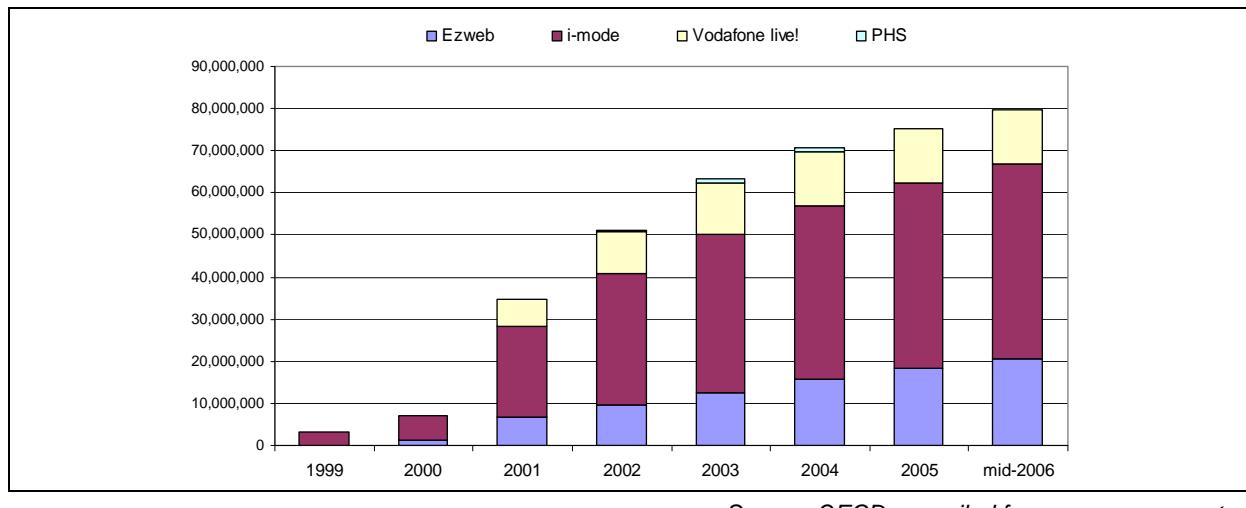
The other ICT which is frequently said to have tangible social impacts is, of course, **mobile telephony**. Figure 6 illustrates the speed with which spread of mobile telephony has outgrown fixed line telephony in the last 10 years. In the developed world, the share of subscriptions per inhabitant exceeded the ratio of 1:1 in 2007. The charts also show that in the developing world, mobile telephony is widespread already (39 subscriptions per 100 inhabitants in 2007), while use of the Internet is still an exception rather than commonplace (see Figure 1).

Figure 6: Development of mobile telephony subscription numbers



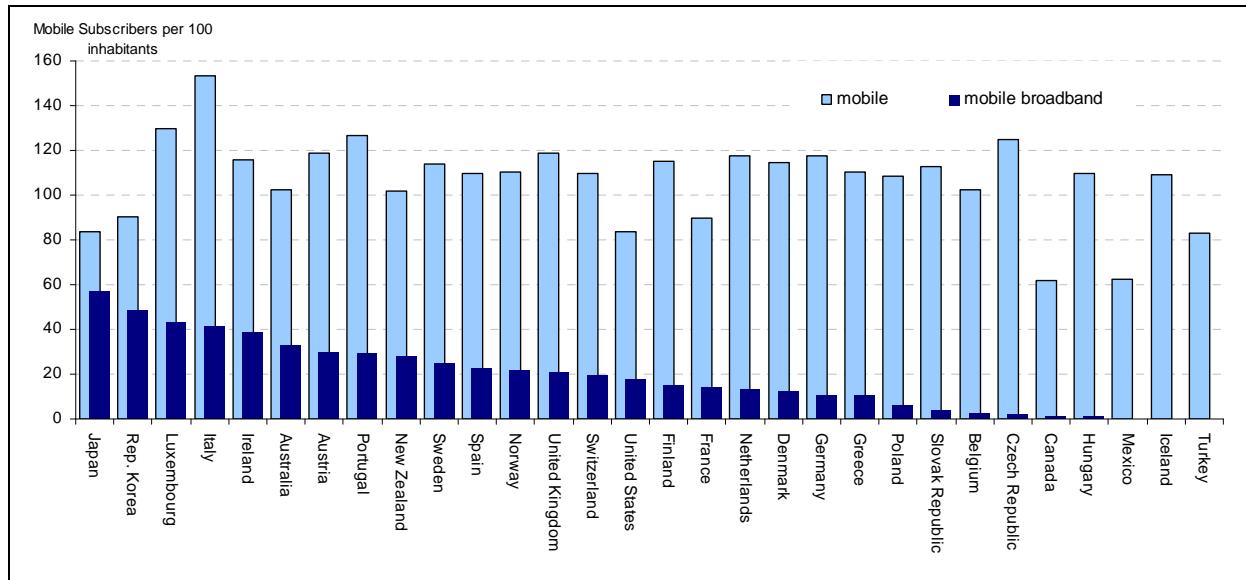
Source: ITU (2009, p. 4)

With regard to mobile ICTs “Asia’s position as the epicenter of mobile communication is undeniable” (Srivastava, 2008, p. 19). For this reason, “much can be learned from tech-savvy economies such as **Japan** and **Korea** that are at the cutting edge of new services and applications, having turned a once simple device into a universal and multipurpose portal” (*ibid.*, p. 27). The significance of the situation in countries including Japan, Korea and Singapore is that they have embraced mobile Internet access much earlier and much more full-heartedly compared to most of the rest of the world. In 1999, mobile browsing services were introduced in Japan, and have developed rapidly since then (see Figure 7). In 2000, Korea was the first country to introduce a 3G mobile network. In both countries, mobile handsets today have roughly the same weight as PCs for providing Internet access. Typically, users access the Internet both via their mobile and at home via a PC – both have become fully integrated (Miyata et al., 2008). LTE handsets, which are capable of supporting the 4th generation of mobile broadband networks, to be commercialised in Japan by the end of 2010.

Figure 7: Mobile Internet services in Japan, number of subscribers, 1999-2006

Source: OECD, compiled from company reports

Overall levels of mobile Internet access are increasing, but the propensity to use mobile Internet access varies greatly by country, see Figure 8 (cf. OECD, 2008a, p. 203).

Figure 8: Mobile broadband uptake in OECD countries, 2007

Data source: ITU (2009)

Mobile phones are not necessarily the only way to access the Internet from a mobile device, but they are one indicator of **mobile access**. As indicated by Figure 8, in Japan and Korea, more than in other countries, people often use mobile access to connect to the Internet. In Korea in September 2002, one-third of mobile users (aged 12 or more) had accessed the Internet via a wireless connection more than once within the previous six months; by September 2005, 43% had done so. In 2005, 99.6% of mobile access was via a mobile phone in preference to devices such as Notebooks, PDAs (personal digital assistants) or smart phones (OECD, 2008a).

2.3 Information Society Indices

There have been many attempts to construct statistical measures which capture the overall position of a country with respect to the development of the Information Society. Table 1

presents the relative position of EU Member States and the selected non-European countries on the ITU ICT Development Index (IDI)². The index consists of three sub-indices on ICT infrastructure and access; ICT use (primarily by individuals, but also households, businesses, others) and intensity of use; and ICT skills (or capacity necessary to use ICTs effectively).

The authors discuss the relative progress of the five countries selected for the present report as follows:

- “The **United States** is down six places, ranking 17th in 2007. Although gaining on both the access and the usage sub-indices, the United States has not yet reached the same high ICT penetration levels as several European countries. For example, in the United States 62 per cent of households had Internet access in 2007, compared to 79 per cent in Sweden.
- **Australia** ranks 14th in 2007, down one from 2002, based mainly on the relatively low values for international Internet bandwidth, and a decrease in fixed telephone line penetration. On the other hand, Australia has made significant progress in broadband use, reaching 33 per cent penetration on mobile broadband in 2007.
- **Canada** has also lost 10 places, moving down to rank 19 in 2007. Similar to the US, Canada improved in both ICT access and usage, but less than other top countries. For example, mobile cellular penetration was only 62 per cent in 2007, and fixed telephone line penetration decreased in the five-year period. Mobile broadband just started, with only 1.5 subscriptions per 100 inhabitants at the end of 2007.
- **Japan** moved up 6 places, to place 12 in 2007. This is primarily based on improvements in the use sub-index (3.45 points or 176 per cent, see Chart 4.8). Japan increased significantly its international Internet bandwidth, and had the highest mobile broadband figures worldwide in 2007, with a penetration of 57 per cent.
- The **Republic of Korea** comes second in the IDI 2007, up two places from 2002. Korea has gained 1.43 points in the index value and has the highest ICT use sub-index value of all countries (5.85, with a gain of 2.64 points). Korea has mainly improved in the area of intensity of use, which is measured by the indicators on broadband. During the past few years, Korea has increased its broadband penetration significantly and comes second globally, after Japan, in mobile broadband penetration.”

Table 1: ITU ICT Development Index (IDI) 2002 and 2007

Country	2007		2002	
	Rank (out of 154)	Index value	Rank (out of 154)	Index value
Sweden	1	7.50	1	6.05
Rep. of Korea	2	7.26	3	5.83
Denmark	3	7.22	4	5.78
Netherlands	4	7.14	6	5.43
Luxembourg	7	7.03	21	4.62
Finland	9	6.79	8	5.38
United Kingdom	10	6.78	10	5.27
Japan	12	6.64	18	4.82
Germany	13	6.61	14	5.02
Australia	14	6.58	13	5.02

² For a discussion of the methodology behind the IDI, see ITU (2009, p. 9-19), and the figure in Annex of the present report.

	2007		2002	
Country	Rank (out of 154)	Index value	Rank (out of 154)	Index value
United States	17	6.44	11	5.25
Ireland	18	6.37	26	4.36
Canada	19	6.34	9	5.33
Austria	20	6.32	20	4.64
Italy	22	6.18	24	4.38
France	23	6.16	25	4.37
Belgium	24	6.14	15	4.91
Estonia	26	5.97	31	3.93
Spain	27	5.91	28	4.10
Slovenia	28	5.88	22	4.47
Malta	30	5.54	29	4.04
Portugal	31	5.47	32	3.87
Lithuania	33	5.29	43	3.17
Greece	34	5.25	30	3.94
Hungary	35	5.19	36	3.49
Latvia	36	5.01	39	3.30
Cyprus	37	4.97	33	3.78
Slovakia	38	4.95	35	3.51
Poland	39	4.95	37	3.34
Czech Republic	40	4.88	34	3.74
Bulgaria	45	4.37	51	2.74
Romania	46	4.16	60	2.48

Data source: ITU (2009)

2.4 National backgrounds

2.4.1 United States of America

As the country in which development of many of today's main ICTs had been initiated, and which has lead developments of new services and applications for "social uses" of the Internet, the USA (and, to some extent, Canada) has been a major source of research findings about the social impacts of ICT. This brings with it the danger that research findings from North America are considered to be fully applicable to other advanced capitalist countries, which would ignore the extent to which there are important cultural differences between US Americans and, for example, Europeans. Examples include the longer distances and greater physical mobility of North Americans, which often make face-to-face social interaction all but impossible, and the much more liberal attitude with regard to data privacy in the private economy.

With regard to social uses of the Internet as well as discussion of social digital divides, most of the quantitative evidence which is available for the USA stems from the Pew Internet and American Life project (Horrigan, 2006). Since early 2000, the organisation has conducted periodic surveys of US American's Internet use. While a number of question modules have been applied in a consistent way through the years, allowing for time series analysis of trends, other questions are being added to shed light on specific research subjects.

The USA were the first country to experience significant diffusion of broadband Internet – in the meantime, they have been overtaken by smaller countries, see Figure 3. The country's head start enabled researchers to test hypotheses about the impact of the switch to broadband on Internet users. They found that, by 2008, "home broadband [had] joined

educational attainment, household income and age as the strongest predictors of internet activity" (Fox, 2008, p. 1).

In contrast, take-up of mobile telephony in North America set off late and rates are still significantly below the average levels to be found in Europe and many parts of Asia. The late start appears to be the reason behind the fact that Internet-based (which in North America has always meant desktop computer based) communication rather than mobile telephony has been the dominant mode for social communication within groups of friends and family in the USA and Canada. In the absence of a sufficiently broad mobile phone user base, applications such as Instant Messaging established themselves as the choice of medium, for example, for students and other groups of young people (Quan-Haase, 2007). Recently, other types of applications such as social networking sites on the Web have to some extent replaced Instant Messaging.

2.4.2 Canada

Whereas the spread of ICT such as broadband and mobile telephony has been largely to the forces of the market in the USA, Canada has seen more policy intervention. This is widely perceived to have enabled a quick build-up of broadband infrastructure in spite of the country's low population density. Already in 2003, Canada was on third place in terms of broadband adoption rates. Peripheral parts of the country have benefited from the National Satellite Initiative, implemented in 2003. As its name suggests, the initiative has greatly helped provide broadband to the many more remote parts of Canada by making innovative use of satellite-based infrastructure.

The World Internet Project (2009, p. 25) reports that Canada has witnessed, in the last two to three years, exploding rates of use of the Internet for socializing and self-expression. 40% of all Canadian Internet users and more than half of those ages 12 to 29 have visited a social networking site.

2.4.3 Australia

The World Internet Project 2009 report describes the situation in Australia as follows:

Australian Government programs have enabled the rollout of enhanced broadband infrastructure necessary for delivering essential services in rural Australia and opening up new markets. The programs include the Higher Bandwidth Incentive Scheme (HiBIS), the Co-ordinated Communications Infrastructure Fund (CCIF), the Demand Aggregation Brokers (DAB) program and the Advanced Networks Program (ANP).

The Australian Government has demonstrated its ongoing commitment to improving the quality of communications services in regional, rural and remote areas by providing \$1.1 billion for the Connect Australia package from 1 July 2006. This package will continue the rollout of affordable broadband to people living in regional, rural and remote areas, extend mobile phone coverage, build new regional communications networks and set up vital telecommunications services for remote Indigenous communities.

The Connect Australia package, along with the \$2 billion Communications Fund, will ensure that Australia becomes a world leader in the availability and effective use of broadband. This will deliver enhanced outcomes in health, education, business, the community and government through capturing the economic and social benefits of broadband.

The country's government favours strong policy intervention in the market in order to bring broadband to all parts of Australia, as is evidenced by the Australian Broadband Guarantee. The Guarantee is for all Australian residents to be provided with access to broadband

services that reasonably compare to broadband services available in metropolitan areas. "Under the Australian Broadband Guarantee, a metro-comparable broadband service is defined as any service that offers a minimum 512kbps download and 128kbps upload data speed, 3GB per month data usage at a total cost of \$2500 GST inclusive over three years (including installation and connection fees)"³.

In 2009, the Australian Government has made substantial commitments to develop Australia's digital economy, including:

- the establishment of a company that will invest up to \$43 billion over eight years to fund an enhanced National Broadband Network, delivering world leading fast broadband to 100 per cent of Australian homes and businesses;
- \$61.1 million to develop and implement targeted initiatives for regional telecommunications in response to the Regional Telecommunications Review; and
- \$1 billion for the Digital Education Revolution package.

While government initiative puts the spotlight mainly on business development and economic competitiveness, there is a significant level of activity for establishing a public debate on how ICT should be used strategically to address ongoing social challenges and further improve living standards.

2.4.4 Japan

The take-up of ICTs in Japan has been strongly conditioned by the policies of the national government, which has always considered technology as a key means to achieve progress also in the social domain. The first major information society initiative, the 2001 eJapan Strategy, had as main objective "to make Japan the world's most advanced ICT nation by 2005", mainly by investing heavily in infrastructure. The four priority policy areas were (Imagawa, 2005):

- Infrastructure: Focus on private-sector initiative, with the goal of creating the world's most advanced environment for Internet-based developments;
- e-Commerce: Focus on building confidence among participants, and on making progress in creating a truly international online marketplace;
- e-Government: Focus on reform of administrative processes in order to make them more efficient and ease interaction with citizens;
- Human resources: Focus on fostering ICT literacy among the population at large, as well as on improving the supply of ICT engineers/experts.

Back then, the target was to connect 30 million households with high-speed, and 10 million households with ultra-high-speed Internet access by 2003. These targets have been exceeded, as by 2003, already 38 million households benefited from high-speed access, and 18.50 million households from ultra-high-speed, i.e. FTTH (Murakami, 2005). Broadband roll-out was indeed rapid and early in comparison to most other countries, with the exception of Korea.

In 2003, Phase II of the e-Japan Strategy was given the main objective to realize a "vigorous, safe, impressive and convenient society" through the practical use of ICT. The focus on making best use of the existing infrastructure was even more pronounced in 2005's u-Japan Strategy (Murakami 2005). The "u" here stood for ubiquitous, as the power of ICT networks

³ http://www.dbcde.gov.au/broadband/australian_broadband_guarantee/ [visited 2009-09-17, 15:45]

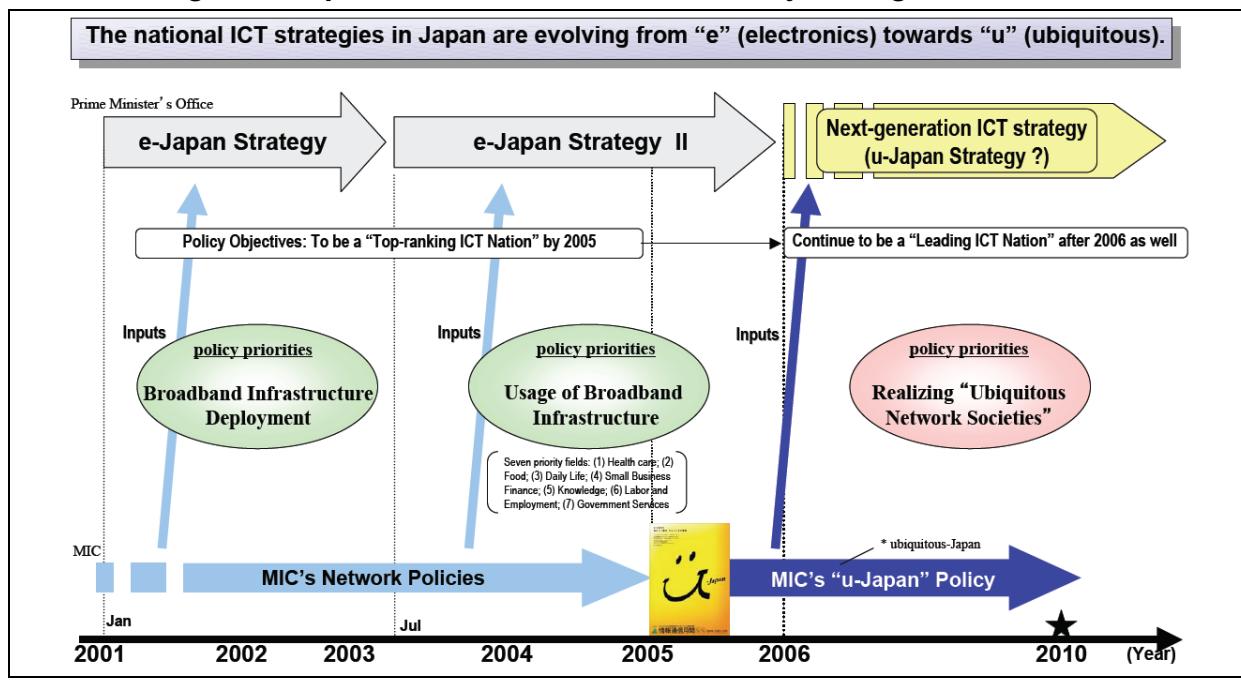
was planned to be extended to every aspect of life for all Japanese (see Figure 9). Background of the u-Japan strategy was the widely held conviction that:

- the country's ICT sector had achieved very good results, partly because of policy-initiated structural reforms: "The goal for e-Japan was to become a leading ICT country by 2005. Through the concerted efforts of the government, centered on the IT Strategy Headquarters, the goal is almost achieved, mainly with respect to infrastructure" (Imagawa, 2005).
- However, the technology's potential for addressing social challenges had not been exploited sufficiently yet. Therefore, "the main issues are to extend the usage of ICT" (*ibid.*).

Serentschy (2007) lists some of the main shortcomings with respect to effective use of ICTs in the social domain:

- 10% of municipalities were not yet connected to broadband in 2007;
- Only 45% of ICT users reported that they appreciate ICT as a way to solve everyday problems;
- The main use of broadband appeared to be related to entertainment and information purposes;
- One third of Internet users were found to feel uncomfortable when using the Internet, which is indicative of a lack of more advanced digital literacy skills.

Figure 9: Japan's national information society strategies 2001-2010



u-Japan's strategy for achieving positive social outcomes focuses on the implementation of an infrastructure for ubiquitous provision of ICT services: "The future trend of ICT is 'ubiquitous networking'. Its utilization is expected to be the breakthrough to solve social problems:

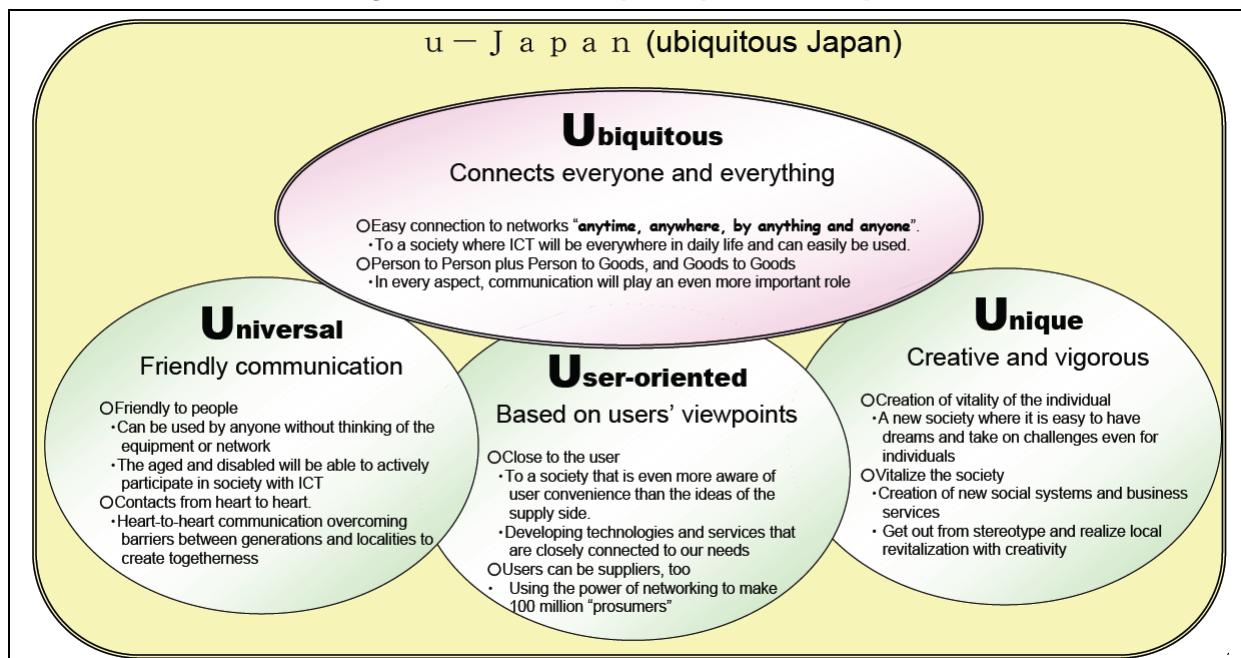
- Ubiquitous network technology is gradually being put into practical and general use such as in smart household appliances, IPv6, IC tags, broadband and digital broadcasting.

- Solution by the latest ICT usage is being developed such as nursing and welfare support systems that ease anxieties in old age, food traceability system to ensure food security, and home security systems to relax anxieties about public safety.“ (Imagawa, 2005)

See Figure 10 for a presentation of the practical meaning of ubiquity, as interpreted in the context of the u-Japan strategy.

Among the social challenges which the government intended to address with the help of ubiquitous ICTs the following were listed in official proclamations (Imagawa, 2005): low fertility rates; need for a better quality of life for the elderly; need for better local community relationships and social capital; need for more patient-orientated healthcare; too high number of traffic accidents; congestion of public transport networks; need for a barrier-free environment for the aged and disabled; global warming; too few employment opportunities for older workers; need for better working environment for female workers; risk of earthquakes, typhoons and man-made disasters; need for enhancing the competitive edge of the Japanese industry; need for promotion of Japanese culture and arts; and need for more efficient public administrative services.

Figure 10: The core principles of u-Japan



Source: Imagawa (2005)

As this short history of Japan's national information society strategies indicates, the national policy in this area has always emphasised a “technological fix” approach, i.e. the identification of technology-based responses to current economic and social challenges. To take an example, ICT-based remote working (telework) has been discussed as a possible solution to some of Japan's labour markets most pressing challenges for many years already. Recent years have seen a stepping-up of policy activity. In November 2005, the Telework Promotion Forum was officially launched by the four ministries involved in promoting telework: MIC; Ministry of Health, Welfare & Labour (MHWL); Ministry of Economy, Trade & Industry (METI); and the Ministry of National Infrastructure (MNI).

In May 2007, the Japan government announced an ambitious goal of doubling the number of teleworkers within three years, as part of its efforts to cope with an ageing society⁴. The government said that it hopes the move will encourage more women to continue working after giving birth, and when faced with the informal care responsibility.

The plan is hoped to make it easier for people with children or disabilities to work, and would improve the balance between people's work and personal lives, a cabinet office official said: "By utilising information technology, we expect that female workers in particular ... will be able to keep working".

The set goal is to raise the number of Japanese teleworkers to about 20 percent of the entire workforce by 2010, from the current level of about 10 percent, or 6.7 million people. No exact definition of the term teleworker was given, however.

Also in 2007, Matsushita Electric Industrial Co. announced that it would begin a telework programme for nearly half of its employees in Japan, quoting as main reason the private sector's effort to cope with an ageing society⁵. Some 30,000 of its 76,000 employees, excluding factory workers, safety inspectors, secretaries and some others, would be eligible to work from home starting on April 1 of that year. Under the programme, applicants will be allowed to work from home once or twice a week on average, with the company loaning out computers and cameras to them for on-line conferences.

Information provided by the Japan Telework Association to the authors of the present report, however, suggest that participation in Matsushita's new telework programme is very slow, with only about 10% of those eligible taking up their employer's offer to partly work from home. As is discussed below in section 3.3, uptake of home-based telework in Japan generally lags much behind expectations (Spinks 2005), for mainly two reasons: First, Japanese work culture strongly relies on face-to-face interaction. Workers who want to advance career-wise are well advised to stay in sight of their supervisor. Second, Japanese homes tend to be small and crowded due to the very high population density in the main agglomerations. This means that workers often lack the space at home for setting up a (tele-) workplace.

Other ICT-based social innovations are embraced much more full-heartedly. Location-based services (such as navigation services) have become extremely popular. Lai (2008, p. 274) explains this with the observation that Japanese people seek to reduce their sense of uncertainty in every way possible.

Against the socio-cultural background of today's Japan, "the novel offerings of mobile communication technologies [...] can be understood as a reinforcement of social order and human security in an often alienated society facing rapid technological modernization. [...] Interestingly, social norms are thereby reinforced rather than eroded" (Lai, 2008, p. 277-278).

Another peculiarity of the way Japanese society has taken up ICTs is the extent to which "the elderly also have an open attitude toward embracing ICT in general and mobile communication in particular" (Lai, 2008, p. 279). This shows in the exceptionally high diffusion rates of mobile phones and other ICT devices and services also among the older Japanese population (Wong et al., 2006).

⁴ See <http://www.busrep.co.za/index.php?fSectionId=&fArticleId=3856468> [retrieved 2007-04-12, 13:30]

⁵ See <http://jayed.us/2007/03/31/matsushita-to-launch-telework-stay-home-programme/> [retrieved 2007-04-12, 13:30]

2.4.5 Republic of Korea

Figure 4 on page 423 showed the remarkable share of broadband access among Korean households. In Korea, more than nine out of ten households had home broadband access already in 2005 (MIC-NIDA, 2006); in comparison the share was about 50% in Canada, the Netherlands, the United Kingdom and the Scandinavian countries in 2006 (OECD, 2008, p. 194). This leading position is no recent development, in fact Korea has held the top ranking in broadband diffusion since 2003. This indicates a very rapid diffusion of high speed internet connections once the technology was introduced. According to a survey by the Korean National Internet Development Agency (NIDA, 2008; KISA, 2009) 78% of all Koreans above six years of age were Internet users in 2009, up one percent from 2008. A recent report by the BBC World Service (2010) calls Korea the “most wired country on Earth”. The offline population mainly consists of Koreans aged 50 or older: 52% of individuals in the 50-59 age group, and only 20% of people in the age group 60 or older are Internet users as opposed to close to 100% among Koreans between 10 and 39 years of age.

Besides the wide diffusion of broadband technology, the widespread use of wireless Internet connection is typical for the use of ICT within the Korean society. In 2009, 70% of Internet users were defined as ‘wireless Internet users’, using either a mobile phone or wireless PC for Internet access (KISA, 2009, p. 53). Unlike other countries, which might have high shares of wireless Internet connection as well, the mobile phone is the most popular device to access the wireless Internet, in preference to devices such as Notebooks, PDAs or smart phones. In 2005, 99.6% of mobile access was via a mobile phone (MIC-NIDA, 2005). Same as for broadband, Korea also takes a forerunner position in the introduction of mobile networks such as HSDPA, being the first country that launched commercial services with this technology in 2006 and reached a nationwide coverage already in 2007.

Katz (2008, p. 21) reports that the country has the highest proportion of high-speed mobile handsets per capita in the world – more than 80% of all Koreans own such a device. The mobile service providers in Korea focus on the residential market rather than on business users. In Korea many mobile applications are designed for the youth market. For instance mobile phones are more popular than PCs for communication and digital music download (Katz 2008, p. 21). One third of the revenues of the mobile market stems from data transmission of such applications. Lee et al. (2002) compare the mobile phone market of Korea and Japan and conclude that there are significant differences between the two that effect mobile Internet adoption and use patterns. Accordingly the preference by Korean users to download entertainment content, such as live TV, music videos or games, is linked to the higher premium placed on emotional values in this culture, as well as high tolerance of public mobile phone use. Consequently, the less intrusive mobile e-mail is less popular – only 15% of the mobile phone wireless Internet users stated e-mail as a mobile service they use (NIDA, 2008, p. 9). In contrast, in Japan, where functionality is more valued, e-mail is the most used mobile Internet application.

In 2006 the International Communications Union published the Digital Opportunity Index that indicates the progress towards an “ideal” information society. Due to its pioneering take-up of 3G mobile technology and leading broadband penetration in 2004, Korea scored the highest points worldwide just ahead of Japan and Denmark (ITU, 2006, p. 43). In contrast to other countries with a high share of Internet subscriptions, in Korea virtually all Internet users are broadband subscribers, with access to advanced services such as video, teleconferencing, multiplayer gaming and triple play (KISA, 2009).

In case of Korea it was not only the high share of “broadband pioneers” (younger, more educated, richer) that lead to this rapid uptake, but rather the ambitious interventions of public authorities. Whereas e.g. in the United States broadband diffusion is steered by the ICT market and its dynamics, Korea has taken an early approach of large scale public investments in order to encourage infrastructure development. Koreas IT strategy already reaches back to the early 1990s where stepping stones for the development of an

information society had been laid (NIA, 2007, p. 9). Broadband was perceived as an information highway that would be able to encourage the economic development of the country.

A milestone in Korea's IT policy was the introduction of the "IT 839 strategy" in 2004, which aimed at reaching a GDP/ per capita of \$20,000 (MIC, 2004). The strategy implied the promotion of eight services (such as WiBro and Home Network Service), three infrastructures (Broadband Convergence Network (BcN), Ubiquitous Sensor Network (USN) and IPv6) and nine economic growth engines (e.g. Next-Generation Mobile Communications or Digital TV). It was already mentioned that ICT in Korea has been perceived as a catalyst for economic prosperity rather than social participation (van Dijk, 2006, p. 251). Hence, the focus of the IT 839 strategy was on key sectors and the development of crucial infrastructure.

In 2005 the share of added value by the IT industry within the whole national economy was more than 13%; worldwide only Finland had a higher value (OECD, 2008, p. 43). Another source estimates that between 2002 and 2008, the contribution of the ICT sector to Korean GDP growth has increased from 11.1% to 17.5%⁶ (NIA, 2008, p. 4).

⁶ Share of the ICT sector in GDP, data source: The Bank of Korea and Institute for Information Technology Advancement (IITA).

3 Selected International Developments per Domain

Below we briefly outline some of the international developments which seem most relevant for the present study. The discussion here focuses on the main peculiarities in the social impacts of ICT in other parts of the world, namely the United States, Canada and Australia, Japan and the Republic of Korea, in comparison to the situation in the European Union. As available evidence of a comparative nature is very limited, the present report should be considered as a first attempt at a comparison of the social impacts of ICT between Europe and the rest of the developed world.

3.1 Participation in Policy-Making

Among the possible social impacts of the Internet and ICTs, positive effects on people's likelihood to participate in the political process have been hardest to find evidence for (cf. Katz & Rice, 2002). Two spheres need to be distinguished when exploring the Internet's role in political participation: On the one hand, the formal political process; and on the other hand grassroots movements, which can give rise to spontaneous collective action (Rheingold, 2008).

Initially most related reports focused on incidences where the Internet, mobile phones and mobile data exchange were of obvious major importance for mobilising people for counter-oppressive activities. Examples include the so-called "People Power II" movement in the Philippines (Rheingold, 2008).

More recently, however, the success of the presidential campaign of Barack Obama in 2008 has convinced many scholars that ICT use can, indeed, exert a powerful influence on the shape and scope of political participation (see below). It appears that ICTs can play a role in the way issues raised by grassroots movements are being taken up within the institutionalised political system, as the Obama campaign has shown.

Table 2: Tools for online engagement at each stage of policy-making

Stage in policy-making cycle	Information	Consultation	Participation
Agenda-setting	Site-specific search engines E-mail alerts for new policy issues Translation support for several languages Style checkers to remove jargon	Online surveys and opinion polls Discussion forums Monitoring emails Bulletin boards Frequently asked questions (FAQs)	E-communities E-petitions E-referenda
Analysis	Translation support for ethnic languages Style checkers to remove jargon	Evidence-managed facilities Expert profiling	Electronic citizen juries E-communities
Formulation	Advanced style checking to help interpret technical and legal terms	Discussion forums Online citizen juries E-community tools	E-petitions E-referenda amending legislation
Implementation	Natural language style checkers E-mail newsletters	Discussion forums Online citizen juries E-community tools	E-mail distribution lists for target groups
Monitoring	Online feedback Online publication of annual reports	Online surveys and opinion polls Discussion forums Monitoring emails Bulletin boards Frequently asked questions (FAQs)	E-petitions E-referenda

Source: Macintosh (2003, p. 13)

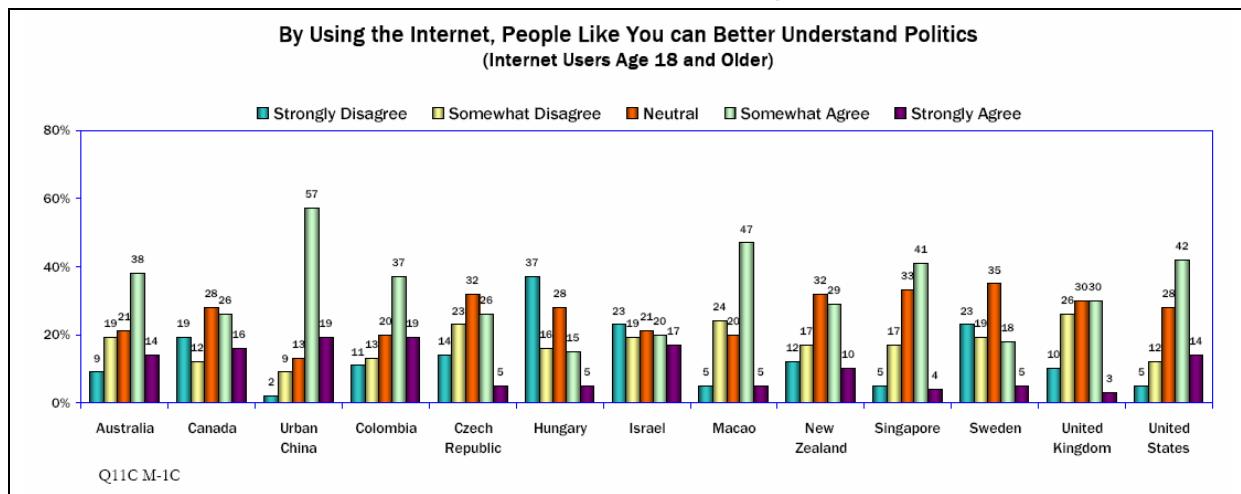
With regard to the formal political process, reference should be made both to the different stages in the policy-making cycle and to different depths of citizen engagement (information, consultation, participation), for each of which ICTs open up certain new possibilities (Table 2).

In general, the biggest impact so far appears to have been in the information area, where transparency of decision-making structures and processes has increased in most countries of the world. ICTs make it easier to monitor the state's operations, to spread what has been observed and to discuss implications. Clearly, this applies in particular to countries with a limited degree of freedom of the press (Rheingold, 2008; Castells, 2009), the most obvious recent example for which is Iran.

Are there systematic differences in this regard between Europe and the other countries discussed in the present document?

The latest data, while providing new insights, still leave many questions open. Comparative statistics from the World Internet Project, a series of harmonised population surveys on a large number of Internet-related topics, show large differences between countries when it comes to the perceived effect of the Internet on respondents' attitudes and experiences with the political process, see the following figures.

Figure 11: Perceived effect of Internet use on people's ability to understand politics (in % of all Internet users)



Source: World Internet Project (2009a: 239) [Data from 2007 or 2008]

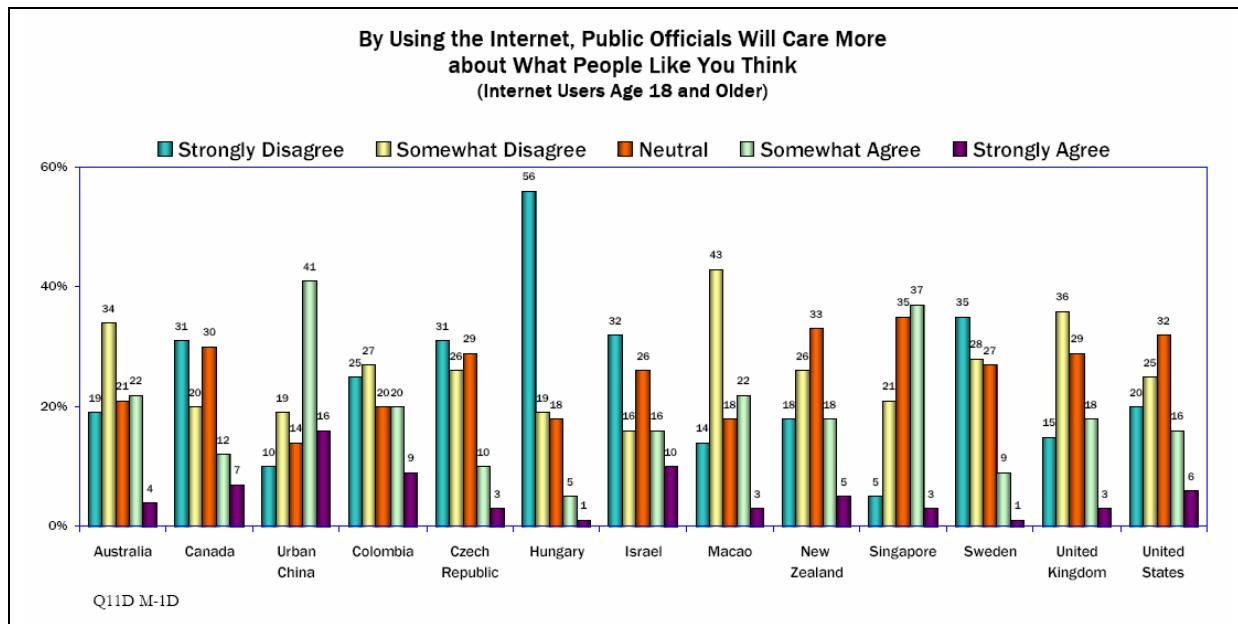
Figure 11 presents data on Internet users' perceptions about the effect of the Internet on people's ability to understand politics. As can be seen, the share of Internet users who perceive a positive impact⁷ of the Internet on their ability to understand politics varies between 56% in the USA, 52% in Australia, 42% in Canada and 20% in Hungary. As opposed to some of the European countries covered by the study, Internet users in the USA, Australia and Canada are much more likely to agree than to disagree with the statement that the Internet increases people's understanding about politics. In general, the data suggest that Internet users indeed perceive an increase of transparency of the political process, which can be expected to benefit the democratic process.

The situation is less positive with regard to the effect which Internet users think they can have on the formal political process. Figure 12 shows that more Internet users disagree than agree with the statement that public officials will care more about what people think as an

⁷ Replies "strongly agree" and "somewhat agree"

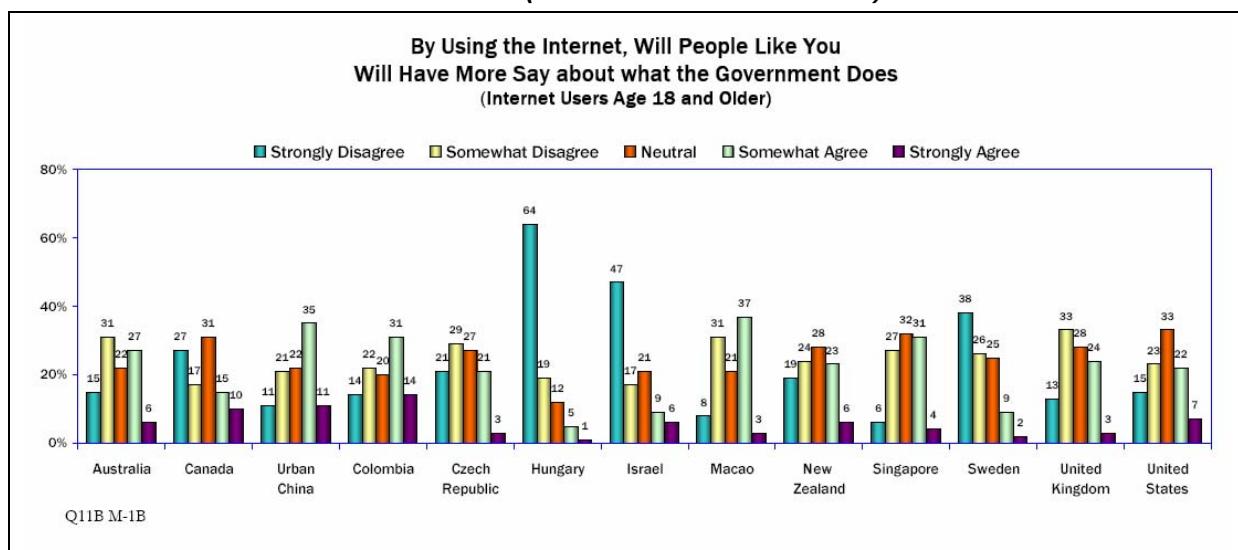
effect of the Internet. In Australia, Canada and all EU countries covered by the study, more than 50% disagree with this statement, whereas only between 6% (Hungary) and 26% (Australia) somewhat or strongly agree. Figure 13 shows a similar picture, albeit with slightly higher numbers of positive replies. It presents agreement, on a 5-point scale, with the statement "By using the Internet, people like you will have more say about what the government does".

Figure 12: Perceived effect of Internet use on public officials' attitudes (in % of all Internet users)



Source: World Internet Project (2009a, p. 244) [Data from 2007 or 2008]

Figure 13: Perceived effect of Internet use on one's influence on government behaviour (in % of all Internet users)



Source: World Internet Project (2009a, p. 254) [Data from 2007 or 2008]

Figure 12 and Figure 13 suggest that most people tend to be sceptical about the direct effect which the Internet will have on the willingness or ability of government to be more receptive to citizens' opinions.

While the WIP data stems from surveys of the online population, other data evidence can help shed light on differences between countries with regard to supply of tools and procedures for online participation.

The United Nations (UN, 2008b) regularly conduct a supply-side investigation of provision of e-participation possibilities by governments. The UN e-Participation Index attempts to "assess the quality and usefulness of information and services provided by a country for the purpose of engaging its citizens in public policy through information and communication technologies. Accordingly, UN Member States are assessed by:

- Their institutional capacity, leadership role, and willingness to engage their citizens by supporting and marketing participatory decision-making for public policy; and
- The structures that are in place which facilitate citizens' access to public policy dialogue.

"In total, 21 citizens' informative and participatory services and facilities were assessed across 189 countries, in instances in which these services and facilities were online and where data was available. Questions were grouped under three categories: e-information; e-consultation, and e-decision-making: [...]

- E-Information: The government web site offers information on the list of elected officials, government structure, policies and programmes, points of contact, budget, laws and regulations and other information of public interest. Information is disseminated through a number of online tools such as: community networks, blogs, web forums, text messages (micro democracy), newsgroups, and e-mail lists.
- E-Consultation: The government web site provides the tools necessary for e-consultation. It allows citizens to set the agenda for the debate through e-petitioning. The government ensures that its elected officials have a web site to communicate directly with their constituents. It maintains an archive of their discussions and provides feedback to citizens.
- E-Decision-Making: The government is willing to take into account the e-inputs of citizens into the decision-making process. The government informs its citizens on what decisions have been taken based on the consultation process."

Results from the latest survey for the developed countries covered by the present report, as well as the EU27, are shown in Table 3.

The results suggest that EU Member States perform, on average, somewhat less well than the other countries covered by the present study, namely the Republic of Korea and Australia, which in 2010 occupy the top positions in the ranking. Only Spain and the U.K. perform better on the index than Japan, the USA (which was leading the table in 2008), and Canada. The extent to which 2010's ranking differs from the results two years earlier suggests that policy initiative can have a sizeable impact in the medium term, but also that supply of eParticipation mechanisms is not determined by structural differences in political culture.

Table 3: UN eParticipation Index values for selected countries, 2008/2010

Country	Index value	Rank in 2010 (out of 193)	In comparison: Rank in 2008
Republic of Korea	1.0000	1	2
Australia	0.9143	2	5
Spain	0.8286	3	34
United Kingdom	0.7714	5	25
Japan	0.7571	6	11
United States	0.7571	6	1
Canada	0.7286	8	11

Country	Index value	Rank in 2010 (out of 193)	<i>In comparison: Rank in 2008</i>
Estonia	0.6857	9	8
Denmark	0.6429	13	3
Germany	0.6143	14	74
France	0.6000	15	3
Netherlands	0.6000	15	16
Belgium	0.5857	17	28
Lithuania	0.5286	19	20
Slovenia	0.5143	20	55
Austria	0.5000	21	20
Cyprus	0.4857	23	98
Sweden	0.4857	23	9
Ireland	0.4429	26	49
Finland	0.4143	30	45
Malta	0.3429	34	32
Hungary	0.3143	36	60
Bulgaria	0.3000	39	135
Latvia	0.2714	45	55
Portugal	0.2714	47	49
Greece	0.2571	48	98
Poland	0.2429	51	55
Italy	0.2143	55	55
Romania	0.1857	64	135
Luxembourg	0.1714	74	11
Czech Republic	0.1286	86	60
Slovakia	0.0714	117	116

Source: UN (2010)

In the following we will discuss some evidence from individual countries.

For the **USA**, data from a series of Pew Internet studies showed an increasing reliance on the Internet as a source for political news and background information (Horrigan 2006). According to the data from spring 2008, some 63% of Internet users (46% of all US adults) were using the Internet, e-mail or text messaging for political purposes. About 39% of Internet users (29% of all adults) were digging into what the author calls ‘unfiltered’ campaign material, such as candidate debates, position papers and speech transcripts (Fox, 2008, p. 2).

In a report on Internet use in the context of the election campaign 2008, Smith (2009, p. 3) reports that “three-quarters (74%) of internet users went online during the 2008 election to take part in, or get news and information about the 2008 campaign. This represents 55% of the entire adult population, and marks the first time the Pew Internet & American Life Project has found that more than half the voting-age population used the internet to connect to the political process during an election cycle.” These figures include all respondents who reported to have done any of the following:

- Going online for news about politics or the campaign. 60% of internet users did this in 2008, compared to 33% in the 2000 election campaign (see Table 4);
- Communicating with others about politics using the internet. Some 38% of internet users did so in 2008;
- Sharing or receiving campaign information using specific tools, such as e-mail, instant messaging, text messages or Twitter. 59% of internet users used one or more of these tools to send or receive messages concerned with politics.

According to the data, the relative importance of the Internet as a source of information about the election campaign has increased as well: Although television is still by far the most widely acknowledged source of information, “among the entire population, the internet is now on par with newspapers as a major source of campaign news – 26% of all adults get most of their election news from the internet [i.e. 35% of Internet users], compared with the 28% who get their election news from newspapers [25%]” (Smith, 2009, p. 5)⁸. More than three out of four mention the television as major source of information about the election.

Table 4: Percentage of adults who go online for news or information about politics or the election (USA)

	1996	2000	2004	2008
Among all adults	4%	18%	29%	44%
Among all Internet users	22%	33%	52%	60%

Source: Smith (2009, p. 5)

These data confirm the increasing importance the Internet has for enabling users to obtain political information in ways which suit their needs and preferences.

While convenience and timeliness are certainly important advantages of the Internet, other findings suggest that the availability of online information services is also leading to changes in the type of information assessed, with potentially far-reaching implications for society. A recent Pew report about the topic concludes from time-series data that:

politically-active internet users are moving away from news sites with no point of view to sites that match their political views, and this is especially true among younger voters. [...] Fully a third of online political users (33%) now say that when they get online political information most of the sites they visit share their point of view – up from 26% who said that in 2004. This rise in partisan information-seeking matches a decline in the number of online political users who say most of the sites they visit do not have a particular point of view. In 2004, 32% of online political users said most of the sites they visited had no particular point of view and that percentage dropped to 25% in 2008. There was no difference between 2004 and 2008 in the number of online political users who said most of the sites they visit challenge their point of view. (Smith, 2008, p. 7)

The Pew survey also established evidence for an increasing tendency of Internet users to participate actively in political discussion on the Web: “Voters are increasingly taking an active role in the political process by contributing their own thoughts or comments to the online debate. In 2008, nearly one in five internet users posted their thoughts, comments or questions about the campaign on a website, blog, social networking site or other online forum. [...] This online participatory class is composed largely of politically active young adults— fully 30% of those who post political content online are under the age of 25, and more than half are younger than 35. Political content creation is also tightly linked with the use of social media platforms such as online social networks, video sharing sites, blogs and status update services such as Twitter” (Smith, 2009, p. 12-13).

One of the most hotly debated question is whether online interaction can mobilise additional segments of the political community who would typically not engage in offline political participation. This would be of high relevance for the democratic process, but until recently there has been very little evidence for this, which made Katz & Rice, in their 2002 overview of research so far, state that “the Internet has not (yet) transformed politics or the nature of

⁸ In this question up to two mentions were allowed.

government" (Katz & Rice, 2002, p. 353). An influential study from Bruce Bimber (2003) also showed limited influence of Internet use on political behaviour.

Newer research in the US e.g. by Muhlberger et al. (2004) and Jensen et al. (2007) has shown, however, that online political discussions tend to draw in a wider variety of demographic groups than the offline equivalent. Offline democratic engagement is typically highly associated with age, income and years lived in the community. In his survey research using a random sample of 1203 US citizens, Jensen et al. (2007: 46-47) found that "conversely, income, age and length of community membership have no bearing on online participation. [...] There is a greater democratization of the political process online compared to offline since none of the SES variables seem to constrain the former".

The most promising case study of a political campaign in which ICTs were used to increase political participation among those who tend to show no interest was certainly the 2008 presidential campaign of Barack Obama. In his latest book, Manuel Castells (2009, p. 364-412) presents an in-depth analysis of the vital role which ICTs, in particular the Internet, played for the – ultimately successful – campaign of Obama. A major element in Obama's strategy was to win the election "by mobilizing actors who were marginalized by the system, and by replacing the power of money with the money of the powerless". This is a key characteristic for what Castells calls "insurgent politics", for which extensive use of the Internet and other ICTs has become a major enabling factor.

The Internet was skilfully used for fund-raising. Whereas traditionally, candidates received a large part of their funding in the form of big contributions from lobbies and other powerful actors, Obama received the majority of funding in the form of small donations each from a very large number of individuals. This was possible only because an estimated 60-90% of donations were Internet-processed, which is much more cost-efficient than traditional channels.

Obama mobilized huge numbers of people who would have been unlikely to vote otherwise: The increase in voter registration was estimated to be 42 million since 2004 (while the eligible population only increased by 6.5 million over the same time). Voter turnout, as well, was higher than in any other presidential election since 1960.

Obama was able to turn a grassroots movement for an "unlikely presidential nominee" (Castells, 2009, p. 373) into a successful presidential campaign because he was able to "inspire positive emotions (enthusiasm, trust, hope) in a wide segment of society by connecting directly to individuals, while organizing them in networks and communities of practice, so that his campaign was largely theirs" (ibid., p. 406). For the purpose, intensive use was made of online social networking applications; My.BarackObama.com, the candidate's platform for discussion among supporters, was designed by Chris Hughes, co-founder of Facebook. At its peak, the platform had about 15 million members. Throughout, care was taken to optimise the interlink between online activities and real-world activities on the ground, in order to increase the effectiveness of both.

In sum, it appears "clear that the Obama campaign surpassed every major political campaign in the use of the Internet as a political mobilization tool both in the US and in the world at large" (ibid., p. 392).

For **Canada**, a report by Veenhof et al. (2008, p. 14) summarised evidence about the relation of Internet use to changes in political participation by emphasising that these need to be understood within a wider context: "Signs that fewer people are turning up at the polls in many established democracies [...] suggest that contemporary North Americans are not as politically engaged as their predecessors. In reality, the nature of political participation is changing. Traditional measures of civic participation, such as voter turnout rates, may no longer adequately capture the extent to which people are politically involved. Many years ago, analysts observed a shift in civic participation away from traditional forms of political

engagement, such as voting, to more unconventional activities, such as boycotts, petitions, and demonstrations [...]".

Statistical evidence available from Canada indicates that a majority of Internet users accesses political information on the Internet, but also that users of online political information are not substituting the Internet for more traditional media channels, but rather use an increasing number of media channels in parallel (Keown, 2007). Veenhof et al. (2008, p. 15) consider this good news as data from Canada and other countries show that "lower rates of political participation are associated with using television as the only source of news" (cf. Keown, 2007; Underhill & Ladds, 2007).

Arguably, differences in the extent to which people use the Internet to participate in policy-related activities are associated with differences in perceptions about whether it is "safe" to publish one's own opinion in the public sphere. A recent survey conducted on behalf of the BBC World Service (2010) found that the share of Internet users who agree to the statement "The Internet is a safe place to express my opinions" differs a lot across countries. While the share of persons expressing such confidence was 55% in the USA, 52% in Australia, 51% in Canada, and 50% in the U.K., it was only 34% in **Japan** and 30% in **South Korea**. This may explain why Internet users in both countries are much less likely to interact online with public authorities than Europeans and North Americans, in spite of the strong supply of opportunities for eParticipation (see Table 3): For example, only 11% of the Korean online population use online public services (APIRA 2009, p. 25).

3.2 Education and Lifelong Learning

Cultural differences between countries are often reflected in widely diverging attitudes to education and huge differences in the way education systems are designed and made to work. As a consequence, the social impacts of ICT in the education and lifelong learning domain differ strongly between Europe and many parts of the rest of the world.

In general, two separate trends need to be looked at. The first trend concerns the **academic world**, where the advent of the Internet has meant improved possibilities for researchers from remote and poor countries to access academic research from scientific communities from all over the world, and also to have their voice heard beyond their immediate geographical horizon. ICTs have "one of the most profound effects [...] in the area of scholarship. [...] This exchange – which can take place via personal e-mail, specialized online scholarly forums, the online posting and archiving of works in progress and prepublication offprints, and electronic journals with much faster manuscript-to-published-document turn-arounds than paper journals – is speeding up and democratizing the means of production of knowledge. A century ago, a scientific breakthrough might have gone relatively unnoticed for months or years. Today, the same discovery can be known all over the world in a short time, and other scientists can ground their own existing and future research in these new findings without having to wait for the study to be written up and published in a print journal" (Warschauer, 2003, p. 26). In order to benefit from international networking, however, researchers need to be able and willing to communicate in the language of international scientific discourse, i.e. in English – which brings with it issues of (loss of) cultural identity.

The second trend belongs to **basic (primary and secondary) education** where distance learning has exerted a great appeal considering the fact that many countries, especially in the developing world, suffer from a highly dispersed population and weak infrastructure. In this area, discussions about the potential of ICT revolve not so much about school education but rather about adult learners and **lifelong learning**. The UNESCO published numerous project references and success stories about computer television and radio assisted learning that were targeted on promoting literacy among adults. Distance learning, however, faces many challenges and has been shown to be successful only if supported by a "community of

practice" which is almost always represented through a physically existent social network (Warschauer, 2003, p. 120–122), which may account for the high rate of failure experienced in practice.

The positive effect of the Internet on people's ability to learn rests on the importance of the Web as a powerful source of information. Data from the World Internet Project (Table 5) confirm that the large majority of people who are using the Internet consider it as an important or very important information source. In most countries covered by the project, the share of persons rating the Internet as important source of information is considerably higher than the rate of persons considering other media channels as equally important.

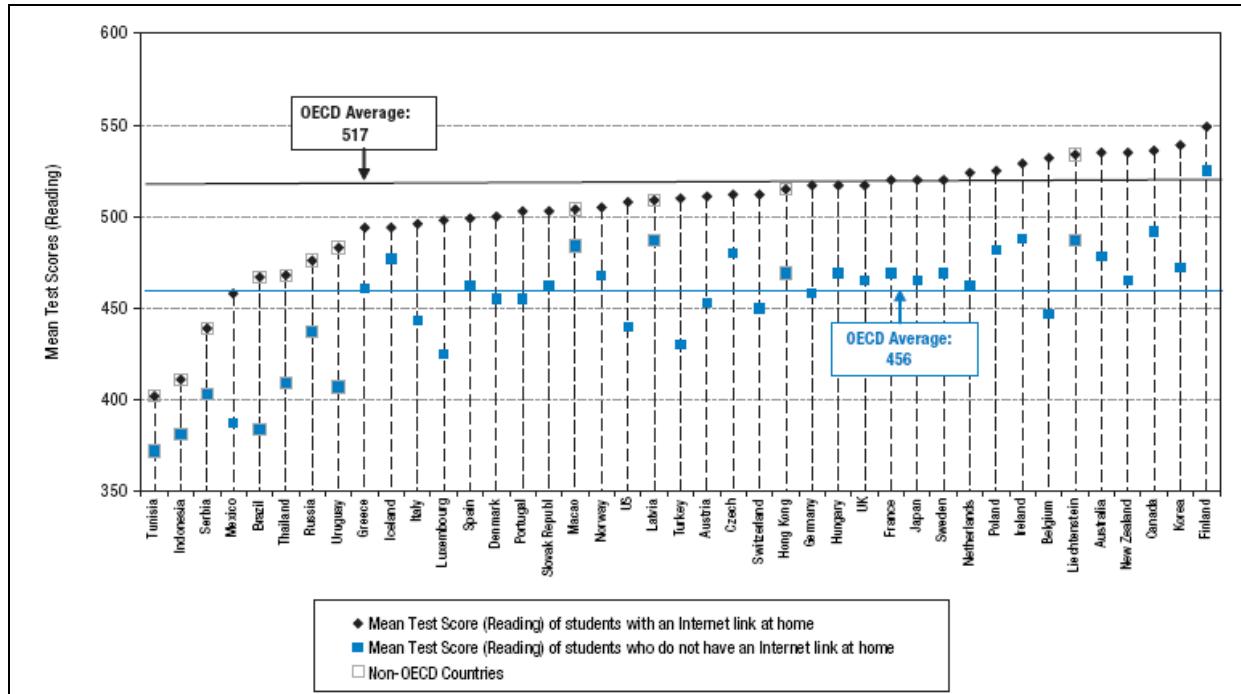
Table 5: Perceived importance of the Internet as a source of information, 2007

Comparison: Importance of Media as Information Sources Internet Users Age 18 or Older Ranking the Media as "Important" or "Very Important"				
	Internet	Television	Newspapers	Radio
Australia	69	32	47	45
Canada	66	50	51	48
Urban China	81	68	66	34
Colombia	86	67	66	61
Czech Republic	71	68	55	46
Hungary	72	61	57	55
Israel	68	54	45	49
Macao	67	63	72	28
New Zealand	71	53	53	44
Singapore	73	55	70	40
Sweden	55	56	53	44
United States	81	69	62	64

Source: World Internet Project (2009a, p. 254) [Data from 2007 or 2008]

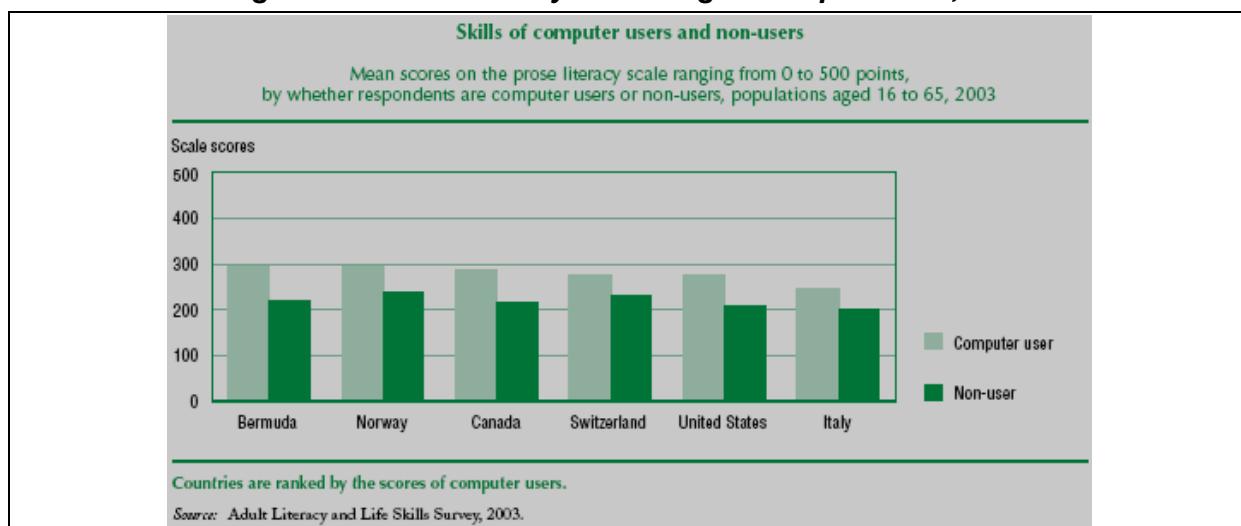
The OECD has carried out research using the 2003 data from the **PISA** (Programme for International Student Assessment) survey (OECD, 2005). Results suggest that the mathematics performance of students without access to computers at home was significantly below that of those with home access to computers (cf. OECD, 2008a, p. 22). This difference was found to be significant for all countries covered by the study. In 23 out of the 31 countries in the study, a performance advantage (albeit a lower one) persisted even after accounting for different socioeconomic backgrounds of students. The performance difference associated with school access to computers is less pronounced, although it is high in the United States, Canada and the Czech Republic.

The study also established that the "highest performances in both mathematics and reading tended to be from students with a medium level of computer use, which suggests that excessive computer use could have a negative impact on school performance" (OECD, 2005). Figure 14 shows how reading proficiency differs between Internet and non-Internet users in the 2003 PISA dataset.

Figure 14: Link between Internet access at home and student proficiency in reading

Date source: UNESCO Institute for Statistics (UIS). Source: United Nations (2008, p. 94)

Only six countries participated in the international 2003 **Adult Literacy and Life Skills Survey** (ALL), which was managed by Statistics Canada. Comparison between computer users and non-computer users shows, again, that the former are likely to perform better, e.g. on the prose literacy scale (see Figure 15).

Figure 15: Prose literacy according to computer use, 2003

Source: Statistics Canada & OECD (2005, p. 185)

The questionnaire applied for the ALL survey contained a number of items on perceived usefulness and attitude toward computers, worded as following: "Please tell me whether you strongly agree, agree, disagree, or strongly disagree with each of the following statements:

- Computers have made it possible for me to get more done in less time;
- Computers have made it easier for me to get useful information;

- Computers have helped me to learn new skills other than computer skills;
- Computers have helped me to communicate with people;
- Computers have helped me reach my occupational (career) goals”

Table 6 shows results for **Canada**.

Table 6: Perceived impacts of computer use, Canada only, 2003

	Age group					Ratio youngest age group: oldest
	16 to 25	26 to 35	36 to 45	46 to 55	56 to 65	
% of computer users who agree with the statement						
Computers have made it easier for me to get useful information	93.6	91.5	88.2	86.8	78.5	1.2
My level of computer skills meets my present needs	91.2	83.9	76.4	72.5	73.0	1.2
Computers have helped me to communicate with people	82.2	79.0	72.5	71.5	62.7	1.3
Computers have made it possible for me to get more done in less time	80.4	74.8	66.9	64.5	57.3	1.4
Computers have helped me learn new skills other than computer skills	72.2	69.5	60.7	56.3	45.2	1.6
I feel comfortable installing or upgrading computer software	59.0	59.0	44.8	36.6	31.8	1.9
Computers have helped me reach my occupational (career) goals	45.3	54.9	46.5	43.0	33.2	1.4

Source: Statistics Canada, Adult Literacy and Life Skills Survey, 2003.

Source: Veenhof et al. (2005, p. 22)

From the **USA** there is evidence that Internet access can make a difference, in particular, to children from low-income families. Jackson et al. (2006) explored data from the HomeNetToo project, the focus of which was on African Americans who had never had home Internet access before. While the study found no (positive or negative) psychological or social effects of introduction of the Internet into low-income households, “Internet use had significant and important effects on cognitive outcomes [...]. Children who used the Internet more had higher GPAs [grade point averages] after 1 year and higher scores on standardized tests of reading achievement after 6 months than did children who used it less” (ibid., p. 163).

3.3 Work

Applications of ICT in the domain of work are, of course, extremely diverse, and it would be futile to try to present a comprehensive picture of social developments associated with ICT-based changes in the world of work. In line with the dedicated Domain Report on “Work”, the discussion in this chapter will be limited to selected aspects of ICT-based work, namely the use of the Internet at the workplace and ICT-enabled types of remote work, often referred to as telework.

Telework and other forms of ICT-enabled flexible ways of working have exerted a strong fascination on policy-makers and the wider public in most parts of the world. Because of the large range of ICT-supported ways of working which are subsumed under the term “teleworking”, there can be no simple answers about effects on remote workers. A recent meta-analysis by Gajendran & Harrison (2007, p. 1535) found that “telecommuting is mainly a good thing. In terms of the psychological mediators, it is associated with increased perceptions of autonomy and lower work-family conflict. Being a telecommuter does not appear to damage one’s social ties with others at work, at least not in a direct way”. Importantly, however, this finding needs to be qualified in the case of high-intensity telework, which is defined as “primarily home-based”:

We found that [...] high-intensity telecommuting accentuated its beneficial effects on work-family conflict. Yet this same mechanism led to deterioration of coworker

relationships. The more extreme loss of “face time” that comes with being a high-intensity telecommuter undermined the depth of ties with peers in the workplace. (Gajendran & Harrison, 2007, p. 1536)

Attempts to compare countries according to overall numbers and take-up patterns of telework are fraught with measurement problems (Pratt, 1997), mainly due to lack of established definitions. Most reports agree roughly with estimates according to which the number of teleworkers, however defined, is roughly two to four times higher in the USA than in Europe (on average), with some EU Member States reaching US levels of take-up, mainly the Scandinavian countries as well as the Netherlands (Empirica, 2003; Illegems & Verbeke, 2003). Numbers in Japan are even lower than the EU average:

- **USA:** In a Pew Internet survey in 2008, 45% of job-holding US Americans reported at least some mount of at-home work, 37% said they are working from home at least a few times per month and 18% stated they work at home every day or almost every day (Madden & Jones, 2008). However, not all of these can be considered teleworkers as many of them are not using ICTs to transfer work inputs and outputs.
- **Europe:** According to the 2005 European Working Conditions Survey, somewhat more than 8% of the EU27 workforce worked at least one quarter of the working time at home, and about 2% spent almost all or all of their working time teleworking from home (Parent-Thirion et al., 2007). If a wider definition is used, figure are much higher: In 2006, almost one in two employees in the EU reported they work “part of their time away from enterprise premises and access their employer’s IT system from there” (Eurostat data, see “Report on Findings from Flash Eurobarometer”, section 3.8).
- **Japan:** According to data collected by the Ministry of Land, Infrastructure and Transport, home-based workers account for 10% of non-primary industry workers in Japan, and home-based workers using ICT 4.5% (Sakamoto & Spinks, 2007).

It has been shown that telework in the **USA**, as in Europe and most other countries, is predominantly an urban phenomenon, whereas rates of uptake are lower in rural and peripheral regions – although these could arguably benefit most from innovative forms of remote working. Telework in the USA has not contributed to any broad-scale equalisation of spatial differentials between regions (cf. Ellen & Hempstead, 2002). Available evidence indicates that the already well-off, highly qualified labour force is most likely to exploit the potential of electronic labour markets. Most researchers agree that migration of high-qualified workers has contributed to rather than attenuated polarisation between central and peripheral regions (Florida, 2002; Sassen, 2006). There are, however, examples of regions that formerly have been disadvantaged by their peripherality, but managed to catch up by benefiting from the possibilities opened up by ICTs. ICT-related new ways of working such as telework, tele-cooperation and multi-locational work seem to play an important role here (Kotkin, 2001).

In Japan, **telework** has for many years been promoted in the context of efforts to decentralise both population and jobs, which tend to concentrate highly in big urban agglomerations, with important implications, for example, for the fragility of the nation state in the case of a major earthquake in the capital region. Telework is also seen as a way to better combine work obligations with family life, an area where – as most Japanese agree – the current situation is neither productive nor socially sustainable. Uptake of home-based telework, however, has been comparatively low (Spinks, 2005), for mainly two reasons: First, Japanese work culture strongly relies on face-to-face interaction. Workers who want to advance career-wise are well advised to stay in sight of their supervisor. Second, Japanese homes tend to be small and crowded due to the very high population density in the main agglomerations. This means that workers often lack the space at home for setting up a (tele-) workplace.

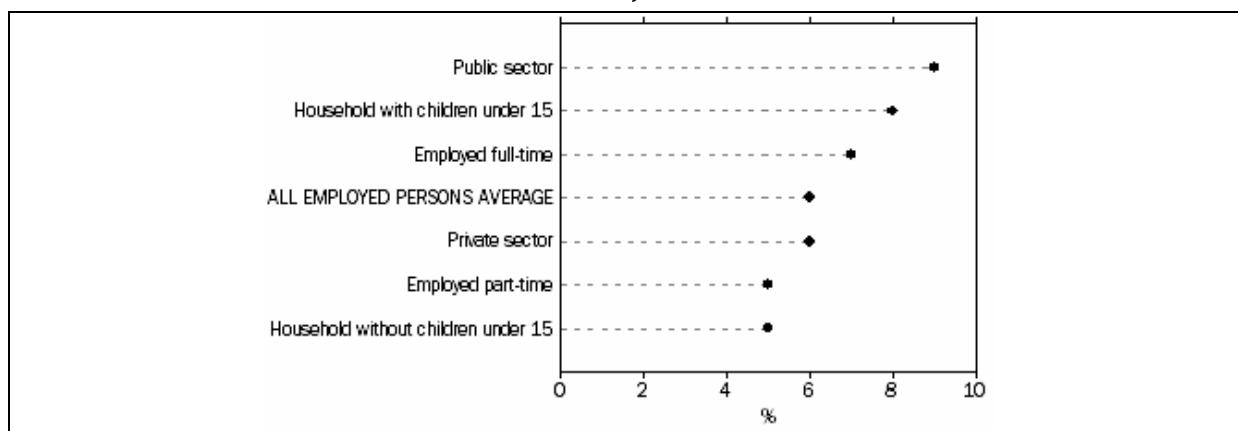
As a consequence, in Japan telework (excluding mobile types of ICT-based work) is usually practised by people who do not belong to the core workforce of companies, but by SOHO⁹-based self-employed workers and by part-time workers. In addition, large employers have started to experiment with telework centres, which are branch offices at locations in the vicinity of employees' homes. The actual social impacts of home-based telework in Japan are therefore strongly conditioned by unfavourable attitudes towards working at home, in spite of the fact that individual teleworkers may indeed benefit from much improved work/family balance and from increases in personal flexibility. As in other developed economies, the form of telework which has spread fastest and furthest is mobile telework (Spinks, 2005).

In Australia, teleworking includes work taking place away from the traditional office which is facilitated by the use of information and communication technologies on a full-time, part-time or temporary basis.

A 2007 survey of 1800 Australian SMEs (Sensis, 2007) found that that 22 per cent of businesses employed teleworkers, but in the majority cases (58%) teleworkers spend, on average, at most 10% of their working time away from the main place of work and teleworking. Among the benefits mentioned by SMEs with teleworkers, "more flexibility for employees" is by far the factor mentioned most often (37%).

Figure 16 presents data about the share of the Australian labour force who have a teleworking arrangement, differentiated by type of employee.

Figure 16: Persons with a teleworking arrangement in Australia, % of all employed adults, 2006



Source: ABS (2008a)

Telework is only one way, of course, in which ICTs have impacted on present-day ways of working. ICTs do play a major role for a growing share of co-located workplaces as well.

According to Pew Internet data from the USA (Madden & Jones, 2008), 62% of employed adults use the Internet at their workplace, and a large share have mobile phones and palmtops that keep them connected to their colleagues and company computer networks whenever and wherever they want or need to be.

The study found mixed views about the impact of technology on people's work lives:

- “80% say ICTs have improved their ability to do their job;
- 73% say ICTs have improved their ability to share ideas with coworkers;

⁹ SOHO = Small offices, home offices

- 58% say ICTs have allowed them more flexibility in the hours they work".

At the same time, half of workers who use ICTs at their job note various negative impacts of communications technology on their work life:

- 46% say ICTs increase demands that they work more hours;
- 49% say ICTs increase the level of stress in their job;
- 49% say ICTs make it harder for them to disconnect from their work when they are at home and on the weekends.

"When asked how much, if at all, technologies such as the internet, email, cell phones, and instant messaging have increased demands that they work more hours, 46% of all Wired and Ready Workers say they feel those demands have intensified, with 16% saying they have increased "a lot." Among those who work in professional and managerial positions, 59% say these demands have increased, as do 56% of those who work more than 40 hours per week.

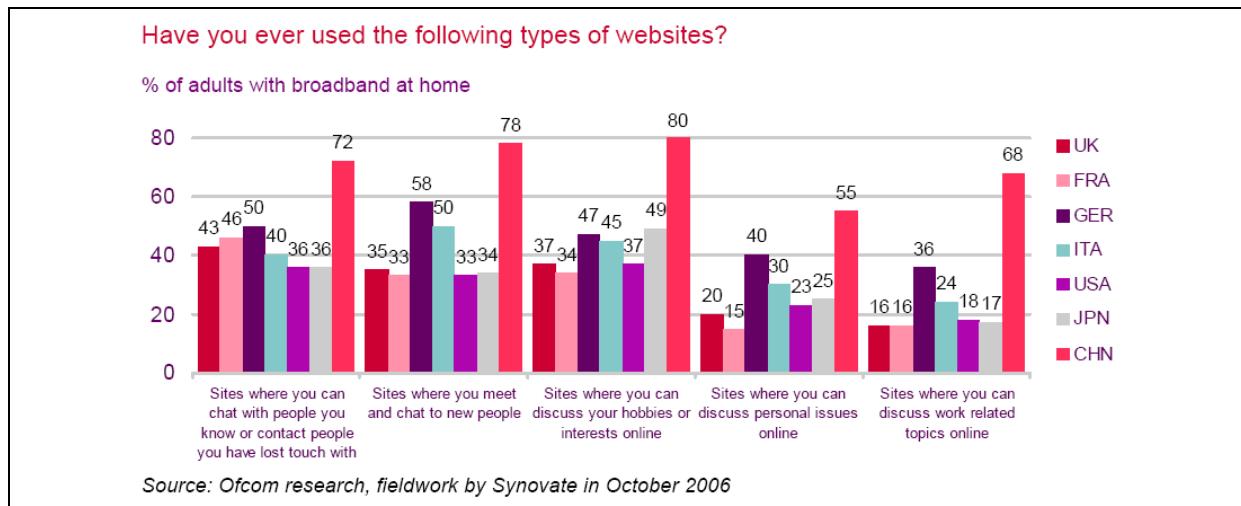
- Of those who work more than 50 hours per week, 62% say that these demands have increased, with 38% saying the expectation that they work more hours has increased "a lot."
- Those who own Blackberries and PDAs are also a widely affected group; 63% feel as though gadgets and connectivity increase demands that they work more hours, and 30% feel as though these demands have increased 'a lot.' (Madden & Jones, 2008, iii-iv).

Findings such as these confirm the observation shared by many experts that "the price of connection, for both community and convenience, is the long arm of the office. There is no downtime for people who have cellls. They are always accessible and available" (Agger, 2004, p. 78). Agger relates this to Michel Foucault's notion of 'discipline' as a new condition of domination: "Discipline, he emphasizes, is both imposed and self-imposed; people do it 'to' themselves as well as have it done to them. Understanding the duality of discipline is crucial to understanding the omnipresence of work, especially as people use new information technologies such as cell phones and computers in order to work longer hours and allow their homes and selves to be overtaken by production imperatives" (Agger, 2004, p. 78).

It appears that all types of ICT-enabled increase in work flexibility bring with them the danger that existing boundaries between work and the rest of life are being dismantled (Turkle, 2008, p. 130). There tends to be a consensus among sociologists who have studies related changes in working life that it is helpful when workers demarcate role shifts between the two spheres, rather than letting them merge (Clark, 2000; Desrochers & Sargent, 2003).

While talk about the Web 2.0 has largely focussed on applications in the leisure domain so far, there is some evidence available that use of Internet applications for social networking is playing a role for working life as well (Figure 17). According to the survey conducted by OFCOM, the UK telecoms regulator, between 16% (UK, France), 36% (Germany) and 68% (China)¹⁰ of broadband Internet users were using websites for discussing work-related topics already in 2006.

¹⁰ Note that while the figure for China is very high, broadband Internet uptake is still extremely low in a country such as China (although the picture looks different if economically advanced regions are being singled out), which means the uptake of ICT-based social networking in the overall Chinese population is still low.

Figure 17: Use of different types of social networking sites, 2006

Source: OFCOM (2006)

3.4 Consumption

As Figure 18 shows, searching for consumption-related information is one of the main activities for which people go online in most countries for which comparable data are available. While there are national differences in online behaviour on practically all product markets, these differences rarely if ever follow a clear pattern, as in the sense of "typically Asian" ways to shop online as opposed to European or North American ways. In general, differences within Europe are much larger than the differences between the "average European" on the one hand and, for example, Korea and Japan on the other hand.

Figure 18: Use of the Internet for selected activities (in % of all Internet users)

Access to Online Information Sites Weekly, Daily, Several Times a Day Internet Users Age 18 and Older												
	Australia	Canada	Urban China	Colombia	Czech Republic	Hungary	Israel	New Zealand	Singapore	Sweden	United Kingdom	United States
Searching for Products	43	37	28	9	52	44	45	43	27	27	43	45
Internet Surfing	39	68	81	38	66	77	84	82	73	46	74	69
Travel Information	21	16	18	6	40	21	33	20	15	19	10	15
Looking for Jobs or Work	14	13	23	11	18	15	10	13	9	11	13	14
Health Information	16	19	32	14	27	23	41	17	20	10	12	21
Religious or Spiritual	3	7	4	6	5	1	21	16	12	2	2	8

Source: World Internet Project (2009a, p. 85) [Data from 2007 or 2008]

Online shopping has taken off fastest and reached the highest rates of penetration in countries with a strong tradition in widespread use of mail order commerce, which includes the **USA** as well as some European countries, including Germany. Still, online shopping continues to be concentrated along particular product categories. Moreover, in most countries spending on online shopping is strongly concentrated, with a relatively small group

of consumers accounting for a large share of online order value. This applies, for example, to **Canada** (McKeown & Brocca, 2009).

Latest data from the Survey on Internet Usage in **Korea** suggest that the items purchased online are most likely to be either clothing or footwear, media products, or cosmetics (KISA, 2009, p. 82). The main problems encountered when shopping online, as well as the main reasons given by non-users for not shopping online, are very similar to the situation in Europe (KISA, 2009, p. 83-84).

One aspect in which consumers both from **Japan** and **Korea** differ strikingly from European consumers is in their faster acceptance of online delivery of media products which used to be distributed in physical format (e.g. CDs, DVDs, books). Much of the market in both countries is driven by downloads to mobile end devices. Mobile music downloads now account for over 90% of all recorded digital music revenue in Japan, compared to 29% for the UK (OFCOM, 2008, p. 3).

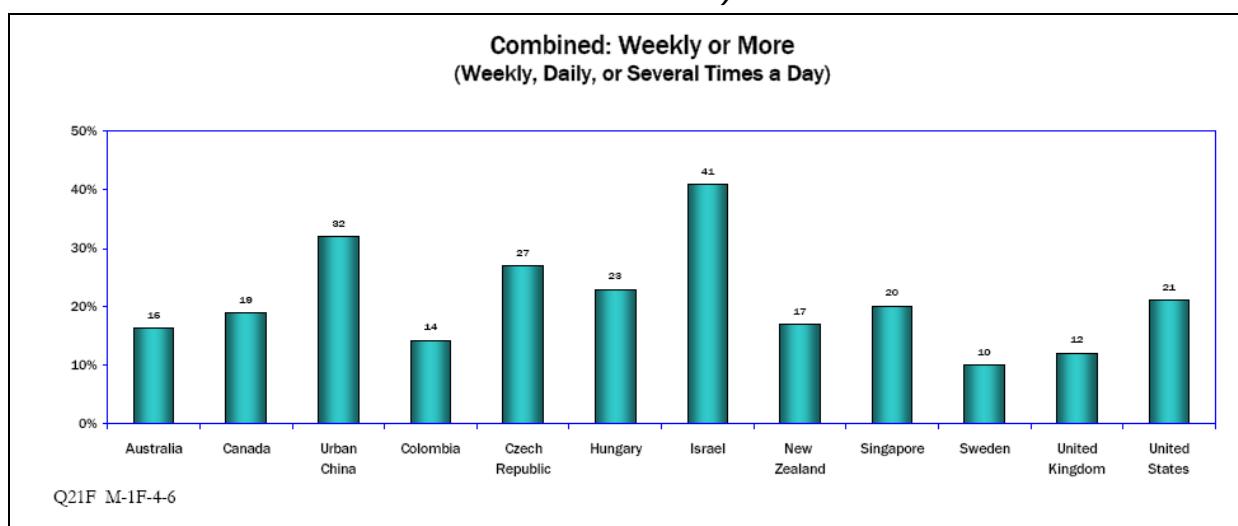
3.5 Health

In the present study, the health domain does not look into all types of ICT applications within the health care system but focuses on patient-facing eHealth applications. This means that the core focus is on the social dimensions of eHealth, in particular issues concerning the implications of eHealth for citizens who make use of such services and the questions of inclusion/exclusion as they arise in relation to eHealth.

Use of the Internet for health-related purposes is one of the most common activities amongst those who are online today, and is also a frequently mentioned reason for acquiring access to the Internet in the first place. Most available data suggest that female Internet users are significantly more likely to access health-related online information than male Internet users. Figure 19 presents data from the World Internet Project on the share of Internet users looking for online health information at least weekly.

For citizens/patients, in the USA the most important current usage of the Internet for health-related purposes is to search for information on health matters of concern for themselves or other members of their families and/or friends (Fox, 2005, 2006). This is an area of considerable importance for public health policy. On the one hand, there is the potential that increased access to health-related information will encourage more proactive approaches to health issues in general and better self-management of health by the public. This could have substantial benefits both for individual health and for more cost-effective usage of health services more generally. On the other hand, there are concerns about the quality of the information that is available on the Internet and also about the uses to which health information is put (Pandolfini & Bonati, 2002; Murray et al., 2003).

Figure 19: Use of the Internet for accessing online health information (in % of all Internet users)



Source: World Internet Project (2009a, p. 110) [Data from 2007 or 2008]

For purposes of the current study, one important set of issues relate to understanding how current users are using online health services and what impacts this type of online activity is having for them and for the health system more generally.

For the **USA**, Pew Internet's series of "Major Moments Survey" found that, in late 2005, more than one in four Internet users (26%) who helped another person deal with a major illness or medical condition stated that the Internet played a crucial or at least important role in the process (Horrigan & Rainie, 2006). Of those who themselves dealt with a major illness or other health condition, 28% claimed that the Internet played a major role.

Moreover, the relevance of the Internet for dealing with crucial decisions in life has been growing: Between 2002 and late 2005, the share of US Americans increased by 54% in the number of adults who said the Internet played a major role as they helped another person cope with a major illness. And the number of those who said the internet played a major role as they coped themselves with a major illness increased 40% over the same period.

The latest available data from the Pew Internet survey (Fox, 2008) indicate that:

- Between 75% and 80% of Internet users looked online for health information, which translates in about two out of three US adults.
- "Home broadband users are twice as likely as home dial-up users to do health research on a typical day (12% vs. 6%) [which indicates that] high-speed, always-on connections enable frequent and in-depth information searches, which is particularly attractive if something important is at stake."
- "There is a generalized fear of misinformation, but the Pew Internet Project has evidence that people are being smart about the internet's place in their lives. A December 2007 study found that medical professionals were the dominant source for people with urgent health questions, which is not what we see in any of the other topics included in the survey: education, taxes, Medicare/Medicaid, changing job status or Social Security. For those issues, the internet or a government agency played much more important roles than did professionals."
- 31% of e-patients say they or someone they know has been significantly helped by following medical advice or health information found on the internet. Only 3% of health seekers say they or someone they know has been seriously harmed by following the advice or information they found online.

Pew Internet also found that people who are affected by a disability or chronic disease make more use of the Internet for health-related issues than other types of patients – but only if they are online: Only half (51%) of those living with a disability or chronic disease are using the Internet, compared to 74% of those who report no chronic conditions. Some highlights of the study include (Fox, 2007):

- “Internet users living with a disability or chronic disease are more likely than other internet users to be wide-ranging online health researchers and to report significant impacts from those searches. For example, 75% of e-patients¹¹ with a chronic condition say their last health search affected a decision about how to treat an illness or condition, compared with 55% of other e-patients.”
- “Newly diagnosed e-patients and those who have experienced a health crisis in the past year are also particularly tuned in: 59% say the information they found online led them to ask a doctor new questions or get a second opinion, compared with 48% of those who had not had a recent diagnosis or health crisis. Some 57% of recently challenged or diagnosed e-patients say they felt eager to share their new health or medical knowledge with others, compared with 45% of other epatients.”
- “75% of e-patients with chronic conditions say the information they found in their last search affected a decision about how to treat an illness or condition, compared with 55% of e-patients who report no disability or illness.
- 69% of e-patients with chronic conditions say the information led them to ask a doctor new questions or to get a second opinion from another doctor, compared with 52% of other e-patients.
- 57% of e-patients with chronic conditions say the information changed the way they cope with a chronic condition or manage pain, compared with 36% of other epatients.
- 56% of e-patients with chronic conditions say the information changed the way they think about diet, exercise, or stress management, compared with 42% of other epatients.
- 31% of e-patients with chronic conditions say they felt frustrated by a lack of information or an inability to find what they were looking for online, compared with 20% of e-patients who report no chronic conditions.”

Summing up the evidence which is available from the USA so far, Horrigan (2006, p. 25) comments that we cannot be sure that “online health care information is leading to better health care outcomes. However, health care problems introduce uncertainty into people’s lives, and the existence of conveniently accessible information helps many people reduce that uncertainty. That, in turn, leads at a minimum to a perception of improvement in health care experiences for people and, often through the exchange of information with professionals or similarly afflicted people, to real improvements in treatment.”

In Japan¹², applications of telemedicine and telecare are being widely tested in pilot projects, in particular in more remote areas of the country (Hasegawa & Murase, p. 2008). However, for telecare services and systems that go beyond simple push button alarms, mainstreaming has yet to occur. Pilot implementations have been funded by the Ministry of Health and Welfare, e.g. the large-scale Telemedicine Promotion Model Project which addresses municipalities to encourage mainstreaming of a set of 20 telecare services directed towards older people living in the community. The Ministry has issued a ‘Guidelines for Implementing

¹¹ Defined by the authors of the study as Internet users who have looked online for health information in the reference period.

¹² Source: ICT & Ageing (2009)

Information Technology in the Areas of Health, Medical Care and Welfare'. One area that has received considerable interest in Japan is **robotics**, and various projects have worked on the development of robotic care systems. In addition, there has also been considerable interest in surrogate pets.

In the area of telehealth, more and more service providers offer video-based medical support, remote monitoring of vital signs and more back-office type systems enabling sharing of electronic information among health care and social care professionals and administrative bodies. The government has pushed for wider diffusion of telehealth within the context of its "Health Japan 21" initiative. In 2007, already more than 100 Japanese local governments were using systems for monitoring the health condition of elderly users at home by transmitting real-time data including blood pressure, ECG, and blood oxygen, to a remote medical institution via a telecommunications network, "using a total of more than 12,000 devices – more than any other country" (Akematsu, 2007).

In **Canada**, ICT applications for the remote provision of health and care services have attracted a lot of attention due to the nature of the country's geography. Six of ten Canadian provinces have established home telehealth programs (Tran et al., 2008).

As in the other countries covered by the present report, searching health information is one of the major activities of Canadian Internet users. Even among elderly Internet users (aged 65 or older, more than one in two searched for medical or health-related information in 2007 (Veenhof & Timusk, 2009). The percentage for users in the age group 45-64 ("baby boomers") was 60% in 2007. For all online health information users, information on specific diseases was the most common type of information sought. "Of those who searched for health information online and visited or communicated with a health care professional in 2007 29% of seniors and 40% of boomers discussed the information they obtained online with their practitioner" (Veenhof & Timusk, 2009, p. 29).

Analysis of Canadian survey data suggests that online health information users tend to possess more online experience than Internet users who did not search for health information (Underhill & McKeown, 2008). In Canada, as in many other countries, searching health-related information appears to be one of the main activities which is associated with the process of the Internet becoming firmly integrated in people's daily lives.

3.6 Community and family

The focus of the "community and family" domain is the impact of ICTs, in particular the Internet, mobile telephony and what has been termed "personal communication technology" (Katz & Aakhus, 2002), on **sociability** and **social interaction**. This refers to the **quality of individuals' social relations** within their social environment, including the family and the communities they belong to. The reason for choosing our focus lies in the interest which the question about ICT's impact on sociability has attracted in recent years not only among social researchers but also among policy-makers concerned with a wide range of topics including employment, social welfare and equality, economic competitiveness, education systems, and urban and regional development.

Three groups of ICTs appear to be of major relevance for "ICT-enabled sociability" are first **e-mail**, which has been one of ICT's killer applications and has driven (and is still driving) people online just to be able to participate in electronic communication; second **mobile telephony**, the diffusion of which has exceeded all expectations as users have quickly grasped the possibilities which it offers them to do things they value highly, but could not do before; and third the so-called **Web 2.0** technologies, which include social networking platforms, blogs and wikis, and which have given rise to a wave in user participation in discussing, exchanging and creating Web content (Benkler, 2006).

All available evidence suggests that social communication-related applications are among most popular uses of the Internet (as well as, of course, of the mobile phone). Nevertheless, the jury is still out on the question whether ICTs such as the Internet and mobile phones are good or bad for sociability, social capital, community and family life. There is evidence – albeit contested – that social networks in the USA have become smaller in the last 20 years. McPherson et al. (2006) found that there has been a general downward trend in the size of social networks, defined as people with whom one discusses important matters, between 1985 and 2004. The share of people who report to have nobody to discuss important matters with has tripled in this timespan (cf. Putnam, 2000).

Katz & Rice (2002) summarised the findings of the research available at the time, which included a number of their own studies in the USA:

- The Internet makes it easier and more effective to participate in all the traditional forms of social capital;
- It also contributes to overall levels of social capital. This is done often by people acting in self-interest, which as a result of network effects creates both individual-level and collective level social capital – intentionally or not. “The Internet provides more opportunities to activate resources and create new knowledge for oneself and others” (*ibid.*, p. 334). Internet users were found to be significantly more likely to have a sense of belonging to a social group than non-users (after controlling for demographics).
- More surprisingly, the Internet also builds new forms of social capital, at least in so far as “computer-mediated communication is not included in definitions of the social-capital processes of community, interaction, or participation”. For example, the researchers found that “those who tend to be introverted find their social contacts expanded via the information relative to their non-surfing counterparts.[...] This means that the “being an Internet user is itself a source of online sociability”.
- Moreover, the Internet offers immense potential for identifying and interacting with people who have common interests, as suggested for example by the proponents of the “virtual communities” idea.

These results were upheld after controlling for the degree of offline sociability and for a number of personal characteristics which can be expected to affect the dependent variable.

Since then, and in line with these findings, an increasing number of commentators and researchers has pointed out that the Internet can play a decisive role in transforming access to social capital. Indeed, ICTs appear to be of special value for maintaining strong and weak ties which are inhibited by physical distance: “The Internet is effective in maintaining weak ties, which otherwise would be lost in the trade-off between the effort to engage in physical interaction (including telephone interaction) and the value of the communication” (Castells, 2001). Katz and Rice (2002) follow from their own extensive empirical research that “the Internet does not reduce social capital but rather contributes to social capital [and] innovative uses of the Internet build what is commonly thought of as social capital”. These findings are confirmed by the extensive research which Barry Wellman and his team carried out in Canada and the USA (Wellman, 2001; Wellman & Haythornthwaite, 2002; Quan-Haase et al., 2002; Veenhof et al., 2008).

Data from the Pew Internet project arrives at a similar conclusion: “The consistent finding in the body of work produced by the Pew Internet and American Life Project has been that the Internet enhances social connectivity in a variety of ways.” (Horrigan, 2006a, p. 22). In a number of survey studies conducted since the year 2000, Internet users reported that e-mail improves connections to family and friends and that the Internet has increased the frequency of communication with the same groups. A report from 2006 is able to explain the processes which can explain these impacts. The study (Boase et al., 2006) explored the role of e-mail

and the Internet for the size and structure of personal social networks. The researchers found evidence that:

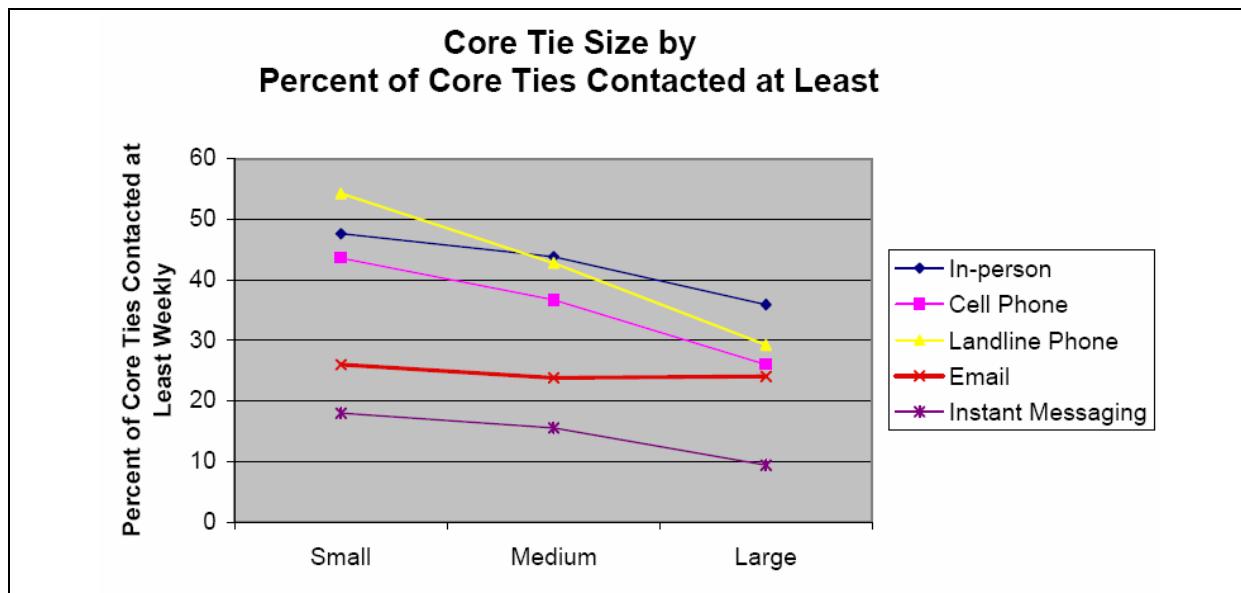
- “E-mail is more capable than in-person or phone communication of facilitating regular contact with large networks”
- “E-mail is a tool of ‘glocalization’. It connects distant friends and relatives, yet it also connects those who live nearby.”
- “E-mail does not seduce people away from in-person and phone contact.”

Support for the first statement was found when analysing the effect which changes in the size of networks of social ties have on the frequency of contacting these ties at least once a week. Figure 20 shows that as “there are only 24 hours in a day, and so it is not surprising that the amounts of time people spend on in-person and phone contact with their [social] ties, on a percent basis, decreases when they have large networks” (Boase et al., 2006, p. 15).

However, “it is a different story for email: People contact the same percentage of [social] ties at least once per week regardless of whether their networks are large, medium, or small. This means that a greater number of social ties are contacted by email in large networks. For example, two people contact 50% of their network ties, but Person A contacts only 5 people in his small network of 10 people whereas Person B contacts 15 people in her large network of 30 people” (*ibid.*).

This findings is of some relevance as it suggests that e-mail is of high instrumental value for maintenance of weak ties, since they are typically much more numerous compared to strong ties and as such more difficult to maintain by means of face-to-face or telephone communication. It appears that, in particular, the one-to-many functionality of e-mail and other ICTs (instant messaging, texting) enables maintenance of larger networks of social ties.

Figure 20: Relationship between size of network of social ties and frequency of contact

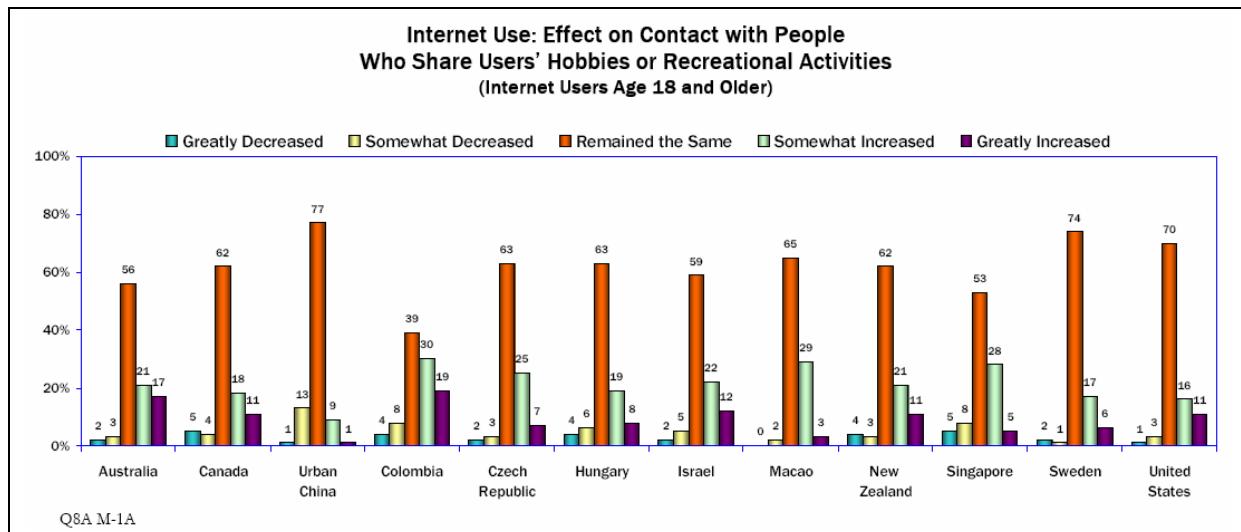


Source: Boase et al. (2006): 16

Comparable statistical evidence is available from other sources as well. The **World Internet Project** (2009a; 2009b) provides data on the perceived effect of respondents' Internet use on their contacts to different groups of people. As the following charts show (Figure 21 to Figure 24), the majority of Internet users in the countries surveyed report that the frequency of contact with other people has not changed. Still, a sizeable minority states that the Internet

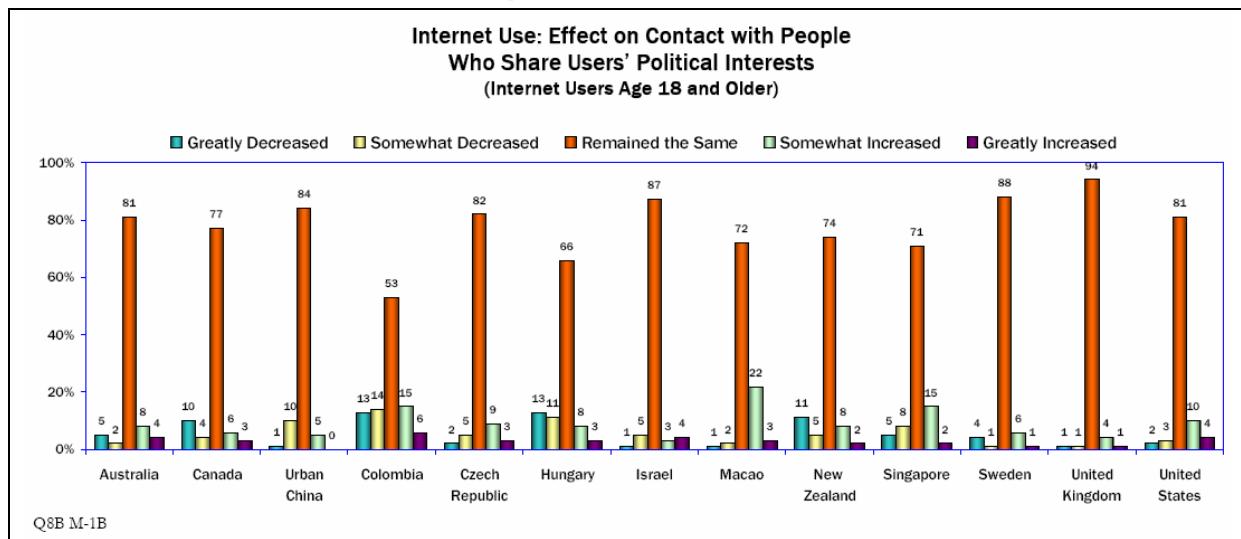
has had a positive effect on contacts with people who share the same hobbies or recreational activities (Figure 21) – from 23% in Sweden to 33% in the Czech Republic.

Figure 21: Perceived effect of Internet use on contact with people who share one's hobbies or recreational activities



Source: World Internet Project (2009b) [Data from 2007 or 2008]

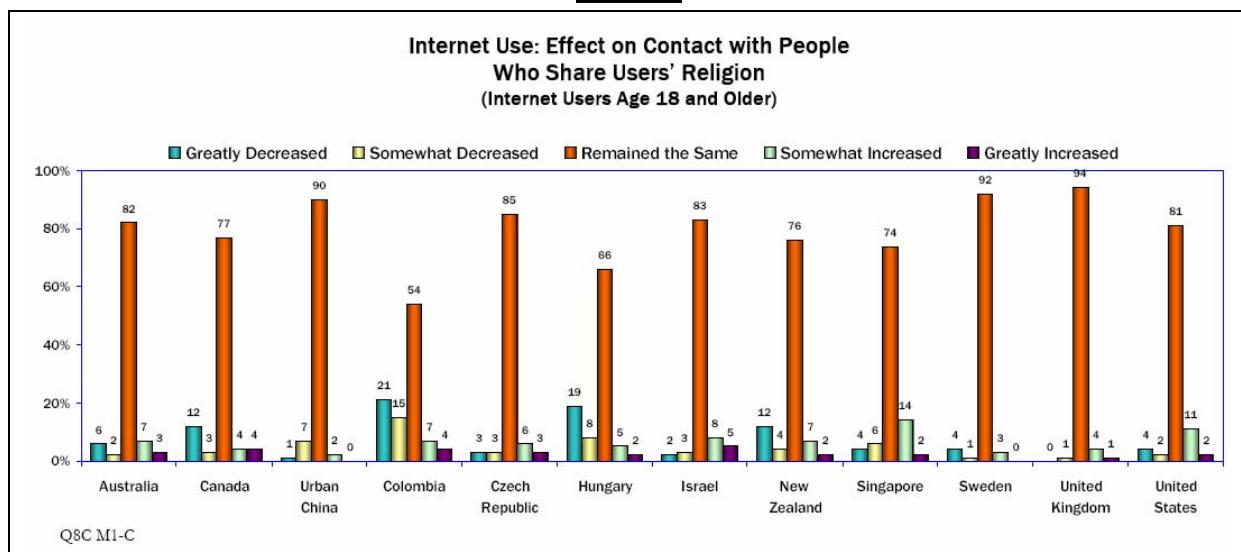
Figure 22: Perceived effect of Internet use on contact with people who share one's political interests



Source: World Internet Project (2009b) [Data from 2007 or 2008]

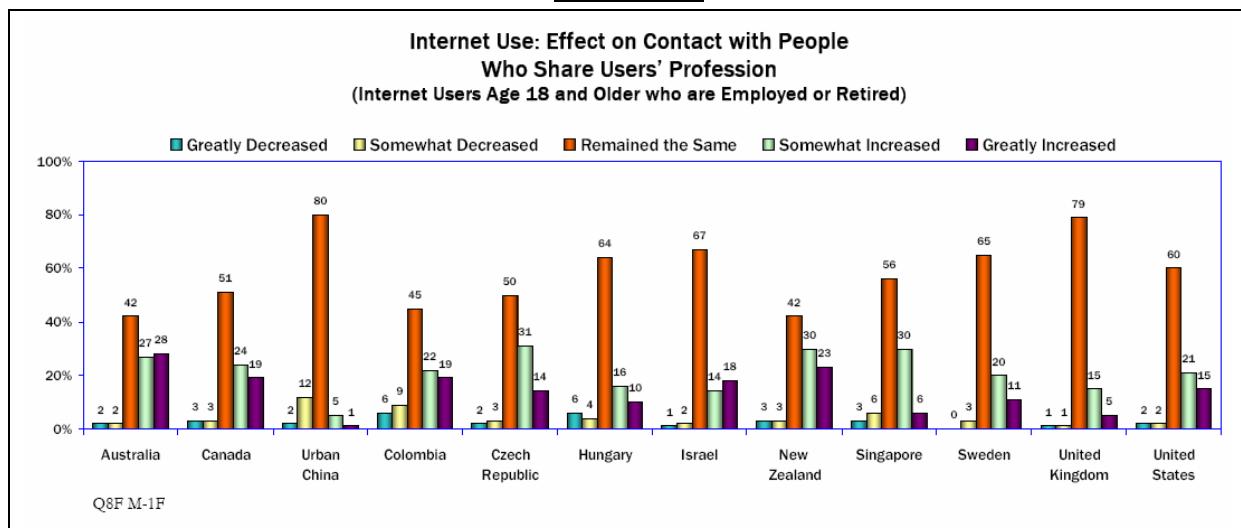
Results are similar with regard to contacts with people who share one's profession (Figure 24) but more inconclusive with regard to contacts who share one's political interests (Figure 22) and religious interests (Figure 23). In a number of countries including Canada, a significant minority some Internet users report that the frequency of contacts to these groups of people has decreased as a result of using the Internet. This raises the question whether, in particular, social exchange around religious beliefs will suffer from the spread of the Internet and online communication.

Figure 23: Perceived effect of Internet use on contact with people who share one's religion



Source: World Internet Project (2009b) [Data from 2007 or 2008]

Figure 24: Perceived effect of Internet use on contact with people who share one's profession



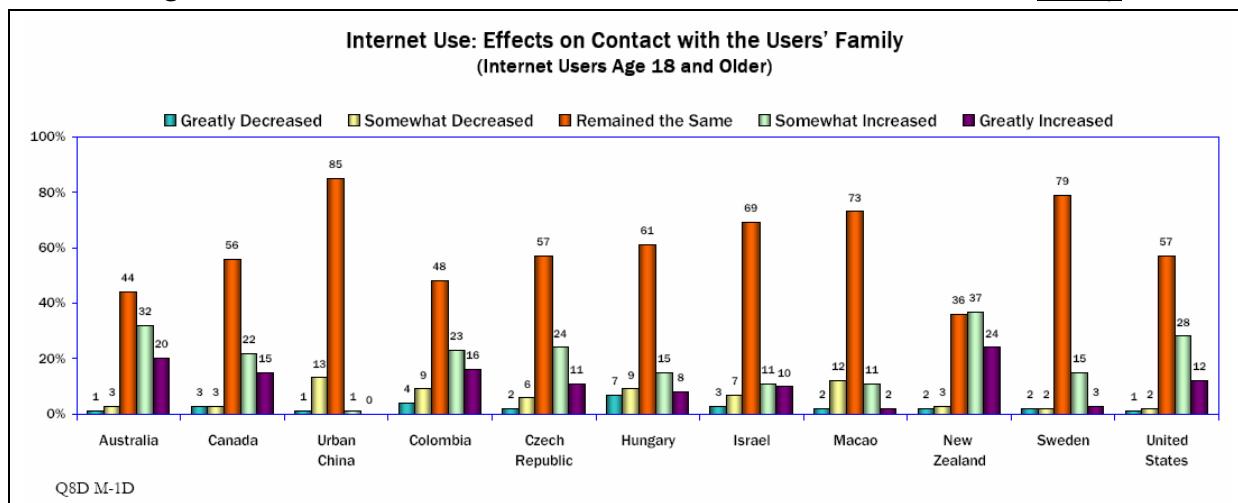
Source: World Internet Project (2009b) [Data from 2007 or 2008]

The World Internet Project data also provides insight into user perceptions about the Internet's impact on their interaction with friends and family (Figure 25 to Figure 28). On average, most Internet users report there has not as yet been any tangible change to the frequency of contacts and to the time spent with friends and family. Those who state that there has been a change predominantly report that the number of contacts has increased rather than decreased: As many as 52% (Australia), 40% (USA) and 37% (Canada) respectively, experienced an increase in contacts with their family, and 62% (Australia), 48% (USA) and 46% (Canada) say there has been an increase in contacts with friends. This implies that significant shares of the population in the countries covered by the survey have already experienced positive impacts of the Internet on their ability to stay in touch with friends and family.

On the other hand, however, a sizeable minority of Internet users reports that the time spent engaged in face-to-face interaction with household members (Figure 26) and – to a lesser

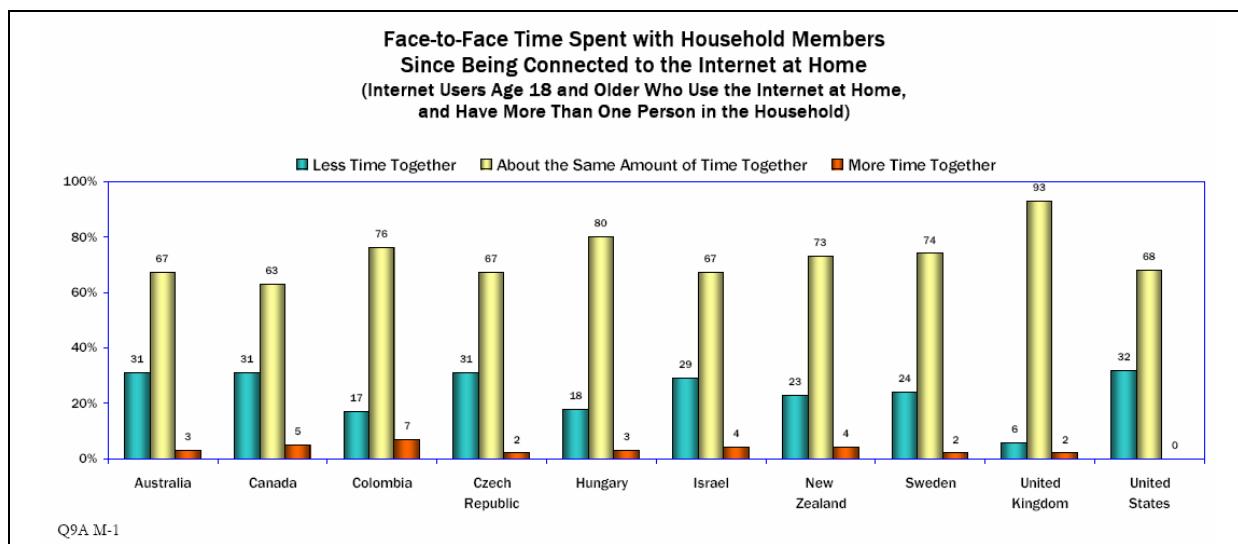
extent – with friends (Figure 28) has decreased as a result of them using the Internet. Slightly more than 32% of Internet users in the Australia, Canada and the USA say that they spend fewer hours with household members at home.

Figure 25: Perceived effect of Internet use on contact with one's family

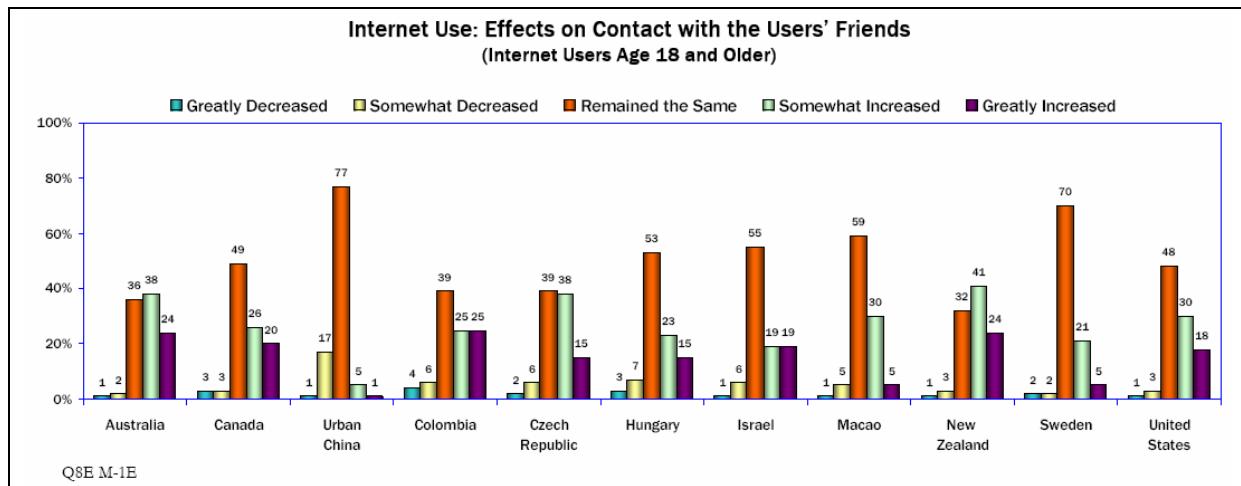


Source: World Internet Project (2009b) [Data from 2007 or 2008]

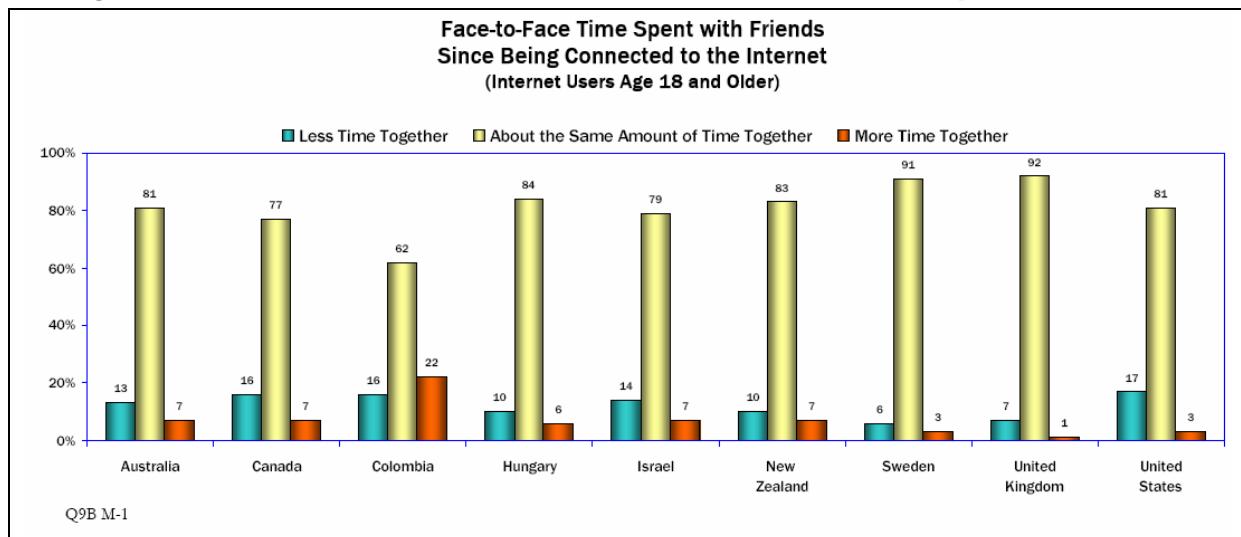
Figure 26: Perceived effect of Internet use on face-to-face time spent with household members



Source: World Internet Project (2009b) [Data from 2007 or 2008]

Figure 27: Perceived effect of Internet use on contact with one's friends

Source: World Internet Project (2009b) [Data from 2007 or 2008]

Figure 28: Perceived effect of Internet use on face-to-face time spent with friends

Source: World Internet Project (2009b) [Data from 2007 or 2008]

In sum, the WIP data suggest that the effect of the Internet on sociability is predominantly neutral to positive, with increasing contacts reported, in particular, for friends, people who share the same recreational activities and people who share the same professions. There are some indications that contacts of a religious nature might suffer from Internet use. Moreover, there is a tendency for less time being spent with household members.

More specifically, what emerges is a picture where interaction with remote friends and family members gets stronger at the expense of interaction, especially face-to-face contacts, with those people who are in the direct vicinity (such as the household). This would also imply a partial substitution of ICT-mediated communication for face-to-face interaction, albeit not necessarily with the same persons.

Early research in **North America**, using ICT networks specifically implemented for the purpose of a pilot project, provided evidence for “reduced isolation and a greater sense of social connection through online interactions” (Papadakis, 2003, p. 132):

- A bulletin board community set up for single teenage mothers was more likely to be used by socially isolated single mothers than by other persons in the same situation (Dunham et al., 1998);

- A comparison between face-to-face and online support groups for parents with mentally disabled children found that parents who perceived their child's condition as a social stigma, or who perceived more stress in caretaking for their child, were more likely to receive effective help online (Mickelson, 1997);
- A number of studies with people suffering from socially marginalised conditions (including AIDS, alcoholism, prostate cancer) showed that these people were more likely to join an online than a face-to-face support group, and that "conversing online helped them feel more socially acceptable and less marginalized, and enhanced a more positive sense of their self-identity" (Papadakis, 2003, p. 133).
- LaRose et al. (2001) showed that emotional support received via the Internet reduces the incidence of depression among college students.
- The Australian 'Atherton Gardens ICT initiative' researched the introduction of ICTs in a low-income housing estate in urban Melbourne. It found that groups did indeed make effective use of ICT tools to develop bonding capital within their own social and ethnic groups. They had little interest, however, in developing bridging capital to communicate with other cultural groups within the estate (Meredith et al., 2002; cf. Gaved & Anderson, 2006, p. 20:).

There has been a lot of attention on the Internet's effect on patterns of time use in the USA – possibly because the post-WW II wave in new communication technology, which put a television in almost any US home, had had a stronger effect on individual time use in the USA than in any other industrialised country. In fact, while large share of respondents in Internet user surveys tend to claim that time spent on Internet use has had a negative effect on time spent watching television, studies using direct measurement of media use have not found any evidence for such an effect in the USA (Stipp, 2009). While this might appear counterintuitive at first sight, the explanation is simple: multitasking in media use has increased strongly hand-in-hand with the increase of the number of media channels available per person and household. Especially among younger Internet users, watching television while being logged onto the net has become increasingly commonplace. There also appears to be a trend towards increasing numbers of people communicating about what they watch on television online with friends or fellow members of online communities of interest – in real time, i.e. at the same time as they enjoy the programme.

With regard to the social impacts of mobile telephony, Castells et al. (2004; 2007), summarised the main findings of their global study of mobile phones' social impacts as follows:

- **Autonomy and "mobile intimacy":** This means the extension of personal links through a "technology closely associated with the body" (Sørensen, 2006, p. 45) rather than with the physical location of the household or the workplace. Users of mobile telephony significantly enhance their autonomy – "vis-à-vis spatial location, time constraints, and to a large extent, social and cultural norms".
- **Networks of choice:** Shifts in the ways people organise their life through the mobile phone and also in the types of networks which are being created and maintained: "Mobile communication has greatly enhanced the chances, opportunities, and reach of interpersonal sociability and shared practice".
- **Instant communities of practice:** "The emergence of unplanned, largely spontaneous communities of practice in instant time, by transforming an initiative to do something together in a message that is responded from multiple sources by convergent wills to share the practice". This practice, dubbed "smart mobs" by Rheingold (2002), has been observed in a number of cases from all around the world in which – within a very short time – a critical mass of political protesters was called to action by means of text messaging (cf. Benkler, 2006).

- **Blurring of established boundaries:** Mobile communication takes place in a spatial context and a new time which is chosen by the communicating subject (in interaction, of course, with the communication partner). Castells et al. interpret this as “an extraordinary strengthening of the culture of individualism (meaning, the primacy of individual projects and interests over the norms of society or reference groups) in material terms”.
- **Users as producers of content and services:** The ready availability of camera-phones which allow users to take photos and record short videos, together with the ability to instantly share self-generated content with others over mobile networks, means that consumers are being empowered to become producers and distributors of content themselves. The possible social consequences of this are, however, far from uniquely beneficial, as Sørensen (2006, p. 45) points out when he warns that the general public may turn “into a mass of ‘little sisters’ reporting any activity deemed inappropriate”.
- **Safety and surveillance:** As survey data have repeatedly shown (Katz, 2006), the mobile phone makes people feel safer at the same time that it makes them enjoy greater autonomy. There are also threats, though: Because mobile networks register the geographical location of devices, this is a technology which makes near-ubiquitous surveillance possible, as a number of scholars have powerfully argued.
- **Fashion, culture and language:** Mobile phones are powerful purveyors of meaning. They are being adopted as part of the process of individual expression, of “the construction of identity by appropriating a new technological environment and still feeling oneself”. As such, the technology may also have transformed the use of language, for example in the form of texting-oriented vocabularies which are optimally tailored to the 160 character limit of SMS messages (cf. Ling, 2008).

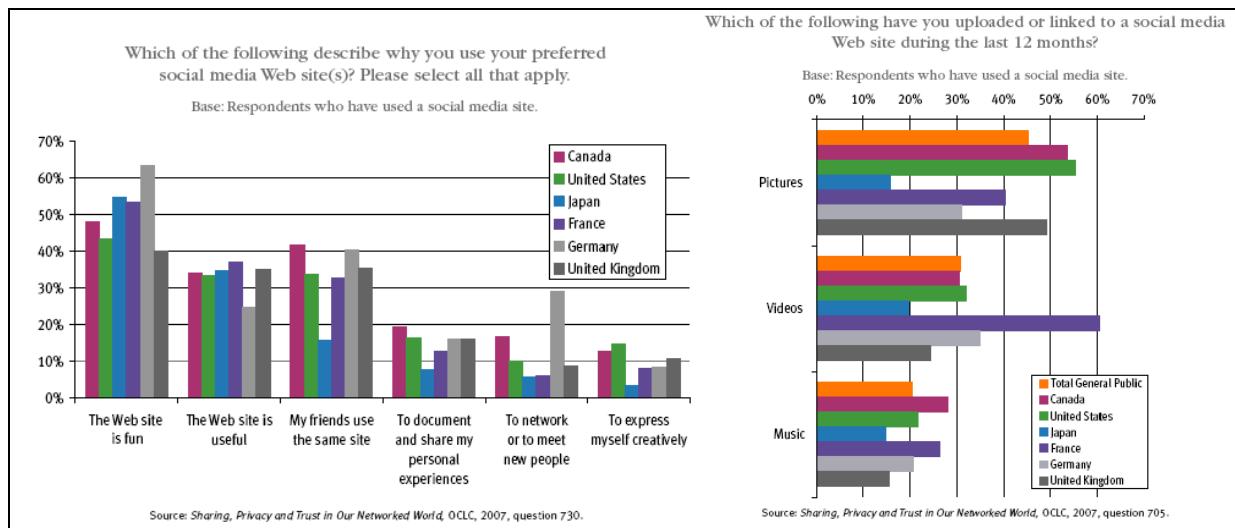
Miyata et al. (2008) explore the use of *keitai* (Internet-enabled phones, which are widespread in both **Japan** and **Korea**), for contacts with close friends and family as well as for supporting new supportive relationships. As Internet access in Japan is through mobile phones roughly as often as it is through personal computers, comparisons between both modes with regard to their effect on different types of social contact are of special relevance here: “Unlike in North America [and Europe], Japanese people send heavy amounts of e-mail via *keitai* phones” (Miyata et al., 2008, p. 212). The basic difference between *keitai* e-mail and e-mailing via personal computers is that the latter provide the ability to conveniently type long and involved messages, which is more difficult on the small keyboards of mobile phones or PDAs. Using own longitudinal data from Japan, the researchers found that both *keitai* and PC e-mail messages were not used to develop relationships that yield new kinds of support, but increases in PC e-mail were associated with an increase in the diversity of social ties, while this was not the case when there were increases in *keitai* e-mail use. “This means that, compared with those that have both *keitai* and PC e-mail, the large percentage of young people that use only *keitai* are disadvantaged when it comes to forming diverse relationships. [...]. This digital divide may continue as the younger generation matures. [...] Because diverse relationships often expose people to new sets of knowledge, information, and ways of understanding the world, this group of young people may hold attitudes that are myopic and based on ignorance rather than on informed deliberation” (Miyata et al., 2008, p. 219-220).

3.7 Creation and Distributed Innovation

The spread of user-created content (UCC) has been as rapid in Japan and Korea as it has in Europe countries, North America and Australia. Some quantitative data are available about the way in which individuals make use of social media websites to share and exchange self-created content (Figure 29). The findings from the OCLC study on “Sharing, Privacy and

"Trust in Our Networked World", which was conducted in Canada, the USA and Japan as well as in three EU countries¹³, suggest that Japanese users are less likely to contribute own content onto these sites. One reason might be that social media sites are typically accessed via mobile end devices in Japan, while in the other countries covered by the survey it is accessed typically through the desktop computer. As hand-held devices are becoming equipped with advanced multimedia capability, Japanese users could be expected to become more enthusiastic contributors of self-created content as well.

Figure 29: Reasons for using social media websites, and contribution of user-created content, 2007

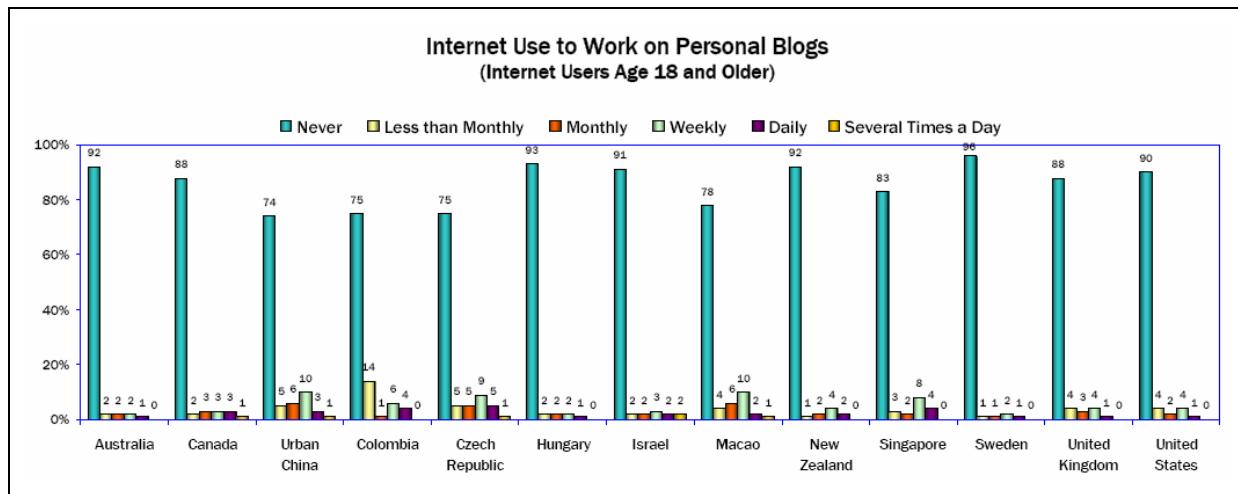


Source: OCLC (2007, p. 2-21, p. 2-36)

In the Republic of Korea, blog ownership is very widespread, especially by younger Internet users. 45% of all Korean Internet users above the age of 6 ran their own blog in 2009 (KISA, 2009, p. 7). The main purpose for doing so is reported as socializing (52% of blog owners), sharing information on personal interests (40%) and recording daily life (38%).

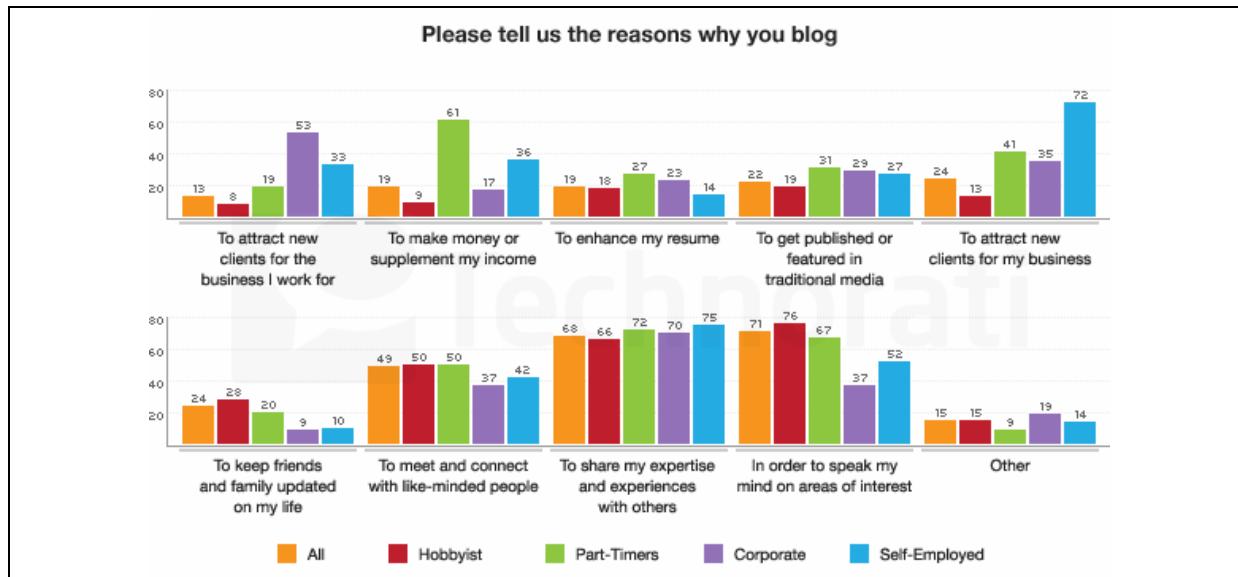
In comparison, the share of Internet users owning a blog in Germany was only 4% in the same year (Oehmichen & Schröter, 2009, p. 448). The data from the World Internet Project (Figure 30), which are about one to two years older, also suggest that blogging is a comparatively rare phenomenon in most countries outside of Asia (here: urban China, Macao and Singapore), with the exception of the Czech Republic.

¹³ The study surveyed a total of 6163 respondents through an online survey between December 7, 2006 and February 7, 2007. Respondents were between 14 and 84 years, 921 in Canada, 821 in France, 846 in Germany, 804 in Japan, 970 in the United Kingdom and 1801 in the United States.

Figure 30: Use of the Internet for work on personal blog

Source: World Internet Project (2009b) [Data from 2007 or 2008]

Empirical evidence about the perceived impacts of blogging on people engaged in the activity is available from a 2009 survey conducted online among 2,828 English-speaking bloggers worldwide (Technorati, 2009). Nearly half of the respondents came from the **United States**, 26% from EU countries. As Figure 31 shows, the most widely shared motives for blogging are related to self-expression, exchange of opinions with like-minded people, and sociability in general.

Figure 31: Reasons for blogging, in percentage of bloggers (2009)

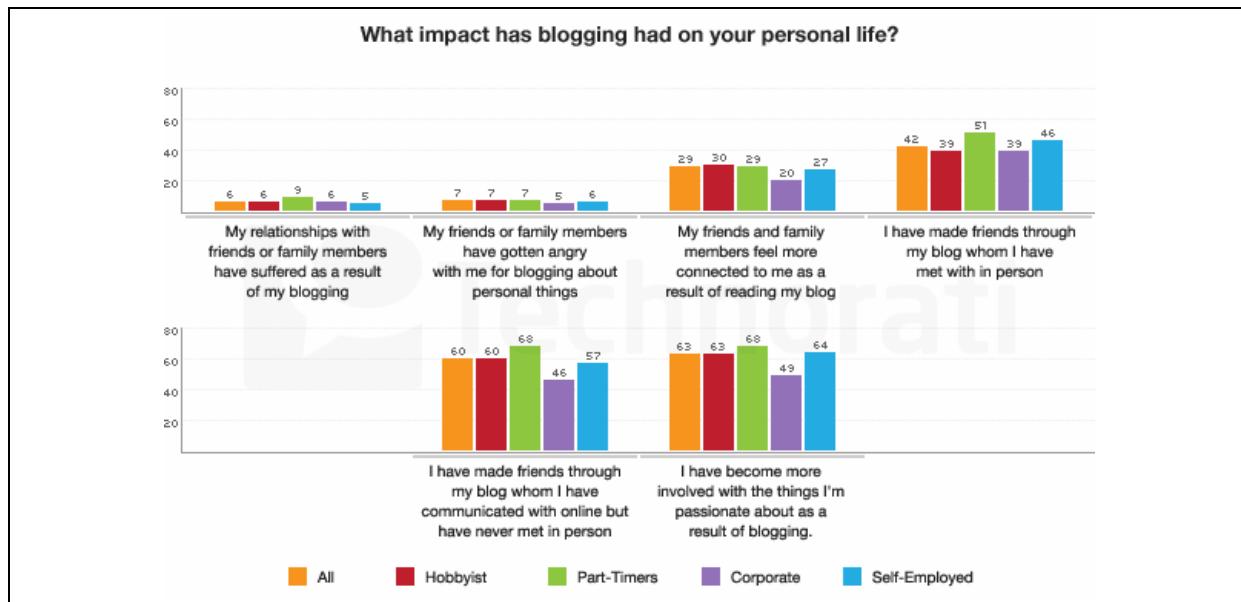
Source: Technorati (2009, p. 2-2)

When asked about the impacts of blogging on their personal life, only few respondents report negative impacts – although this may be the result of methodological constraints of the study¹⁴ rather than a true representation of real life impacts. A majority of bloggers report they have become more involved in the things they are interested in, and have made friends

¹⁴ i.e. social desirability effects

through their blogs. What is more, 42% of bloggers state that through blogging they have made acquaintances which they subsequently have also met in person.

Figure 32: Perceived impact of blogging, in percentage of bloggers (2009)



Source: Technorati (2009, p. 2-2)

In sum, there is indeed a lot of evidence which supports the assumption that the Internet and, in particular, Web 2.0 applications have made a real difference for all those people who feel the urge to be creative and to socialise around their leisure pursuits with others who share similar interests. Moreover, there appear to be sizeable national differences in the take-up and usage patterns of different types of applications for user-created content. Blogging is comparatively widespread in Asia, particularly in the Republic of Korea, while Internet users in the USA, Canada, Australia and Europe are more likely to prefer other ways of exchanging user-created content.

4 Conclusions

The present report gave a very brief overview, as far as available evidence allows, of the main peculiarities in the social impacts of ICT in other parts of the world, namely the **United States, Australia, Canada, Japan** and the **Republic of Korea**, in comparison to the situation in the European Union.

We found that very little comparative research is available on this subject apart from statistical data on take-up rates and the activities for which people use the Internet, mobile phones and related ICTs. Studies which have tried to compare the measurable social impacts of ICT between, for example, Asian countries and the USA have often, in an attempt to identify single causes for the differences found, arrived at overtly simplistic conclusions (e.g., Takahashi et al., 2008).

Most of the research which is reported about in the international arena is based on data collected in North America, including the influential studies of the Pew Internet Project. There is the danger that research findings from the USA are considered to be fully applicable to other Western countries, which would ignore the extent to which there are important cultural differences between US Americans and, for example, Europeans. Schemett (2003, p. 82) reminds us that "Americans perceive themselves as living in a hostile environment. Fear of random crime and fear of one's neighbors incites the retreat into the private sphere; so that, for many, the boundary between public and private is not a friendly zone". To the extent that Europeans differ in this point, US research findings about telework, and other developments which directly affect the boundary between the public and the private sphere might not be applicable to European contexts.

Having said that, when it comes to patterns of use of both the Internet and mobile telephony, available research suggests that differences between EU Member States are larger than differences between North America and the EU average. For example, users from Southern Europe tend to use the Internet mainly for recreational purposes and communication, while other Europeans are more likely to use it predominantly for instrumental purposes such as eBanking and online shopping.

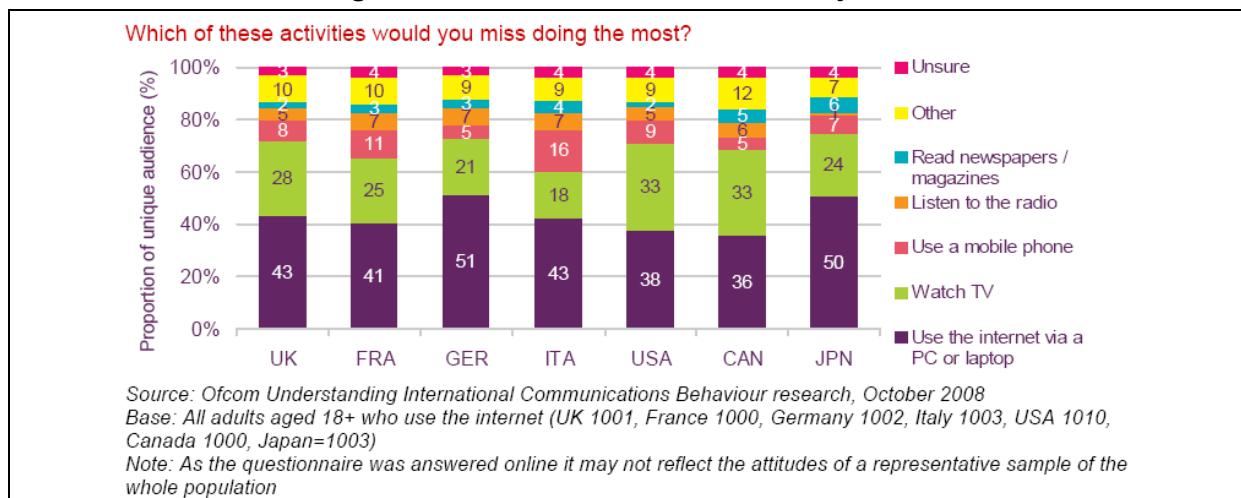
In both Korea and Japan, development of ICT infrastructure and applications has been rapid in recent years, especially in the area of mobile (personal) communication technology and broadband (fibre to the curb). Strong public investment in ICT is mainly seen as necessary for economic development, whereas applications for strengthening civil society are all but absent. In the social domain, plans for deployment of ICT (e.g. ubiquitous computing) for addressing current challenges are ambitious, but it appears that they may be guided by technological determinism, without taking proper account of the implementation contexts. One example is ICT-based remote work, which for a long time has been strongly promoted by the Japanese government as well as some employers, but in practice take-up is very modest, arguably because working cultures continue to rely on face-to-face interaction.

On the other hand, ICTs have been taken up enthusiastically where they allow the nurturing of social ties, especially among tight-knit groups of people such as families and friends. The autonomy afforded by the mobile phone, for instance, is being perceived as strongly empowering especially by individuals who used to suffer from strong social control, i.e. the youth and also, to some extent, women.

On a final note, Figure 33 presents the results from a survey question about the media activity which respondents would miss most if it was – for whatever reasons – suddenly not available at all. Across all countries covered by the survey, the Internet represents the media activity which the largest number of respondents would miss the most. Even taking into account that the survey excludes people who do not use the Internet, it must be surprising to see that the Internet is considered more vital to many people's lives than the

television. Even in the USA, where people tends to watch more television than in almost any other country in the world, only 33% mention they would miss television the most, as opposed to 38% who would miss the Internet the most.

Figure 33: Most missed media activity, 2008



Source: OFCOM (2008, p. 134)

As these findings demonstrate, the Internet – as well as other ICTs including the mobile phone – has clearly penetrated the society of all countries covered in the present report to an extent which is bound to have wide-ranging impacts in all spheres of life.

Similar results were found in a representative survey commissioned by the BBC World Service (2010) and conducted in 26 countries around the world: The survey asked those respondents who already use the Internet whether they “could cope without the Internet”. 84% of Internet users in Japan said they could not. The figure for Korea was 57%; Portugal 44%; France 42%; Germany 41%; U.K. 40%, Australia 38%; USA 36%; Canada 35%; and Spain 30%.

The same survey also asked whether access to the Internet “should be a fundamental right of all people”. In Korea, 96% of all respondents (including non-users) agreed with the statement. The figures for the other countries were: Portugal 87%; Australia 85%; Spain 83%; Germany 78%; Spain 77%; USA 76%; Canada 76%; Japan 76%; and U.K. 75%.

The differences found between, on the one hand, Korea and Japan and, on the other hand, countries with lower penetration of high-speed Internet suggest that broadband has a significant effect on the degree to which the Internet is embedded in everyday life. In countries such as Korea, the Internet – in combination with mobile ICTs – has become a core element in the way people deal with the daily challenges of life, as well as in the ways they go about their leisure pursuits. It can be expected that the development of the Information Society in Europe will follow along broadly similar paths, although national differences will remain to be significant.

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6 Annex

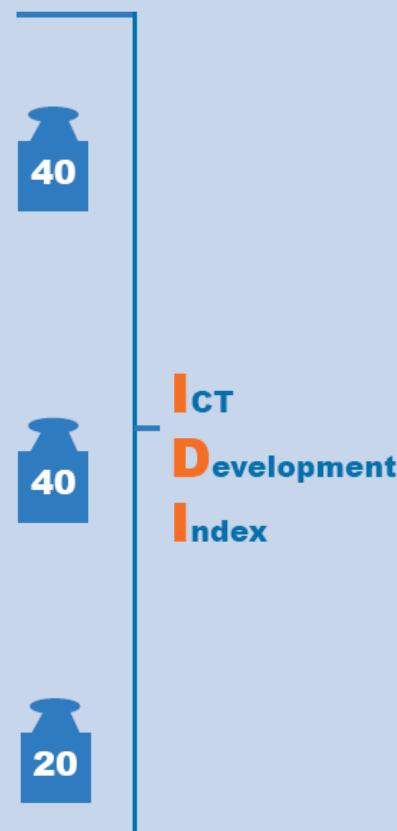
6.1 ITU ICT Development Index – Weighting of indicators

ICT access		
	Ref. Value	(%)
1. Fixed telephone lines per 100 inhabitants	60	20
2. Mobile cellular telephone subscriptions per 100 inhabitants	150	20
3. International Internet bandwidth (bit/s) per Internet user	100'000*	20
4. Proportion of households with a computer	100	20
5. Proportion of households with Internet access at home	100	20

ICT use		
	Ref. Value	(%)
6. Internet users per 100 inhabitants	100	33
7. Fixed broadband Internet subscribers per 100 inhabitants	60	33
8. Mobile broadband subscribers per 100 inhabitants	100	33

ICT skills		
	Ref. Value	(%)
9. Adult literacy rate	100	33
10. Secondary gross enrolment ratio	100	33
11. Tertiary gross enrolment ratio	100	33

Note: * This corresponds to a log value of 5, which was used in the normalization step.
Source: ITU.



Data source: ITU (2009)

Report on Findings from Flash Eurobarometer

Corvinus University / empirica

Gyorgy Lengyel, László Lőrincz and Karsten Gareis

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0 Key Findings

Data from the Flash Eurobarometer 241 (which are representative for the EU adult population aged 15 or older in 2008), suggest that there are still significant digital differences in Europe:

- Internet use in the youngest age group is more than twice as high as in the oldest one (95% vs. 38%).
- Highly educated individuals are more than three times as likely to use the Internet compared to persons with low educational attainment (83% vs. 24%).
- Small differences can be found between people living in urban and rural areas.
- Manual workers are also at a disadvantage in terms of Internet use, although two-thirds among them already use the Internet.

When analysing differences in the extent to which social-demographic groups make use of the Internet for engaging in civic participation (i.e. “active participation in the activities of sports clubs, religious or voluntary aid organizations, trade unions, campaign organisations), the basic difference lies between those who use the Internet and those who do not: Nearly one in two Internet users engages in civic participation, while among non-users only one in three does. No significant differences can be found in this regard between non-users who have no access to the Internet and non-users who do have access.

On the basis of the sociological literature (Bourdieu, Coleman, Putnam, DiMaggio, Hargittai, etc.), we created a conceptual typology of ways of Internet use which distinguishes between three types of Internet use: recreational, resource enhancing and instrumental (Table 1).

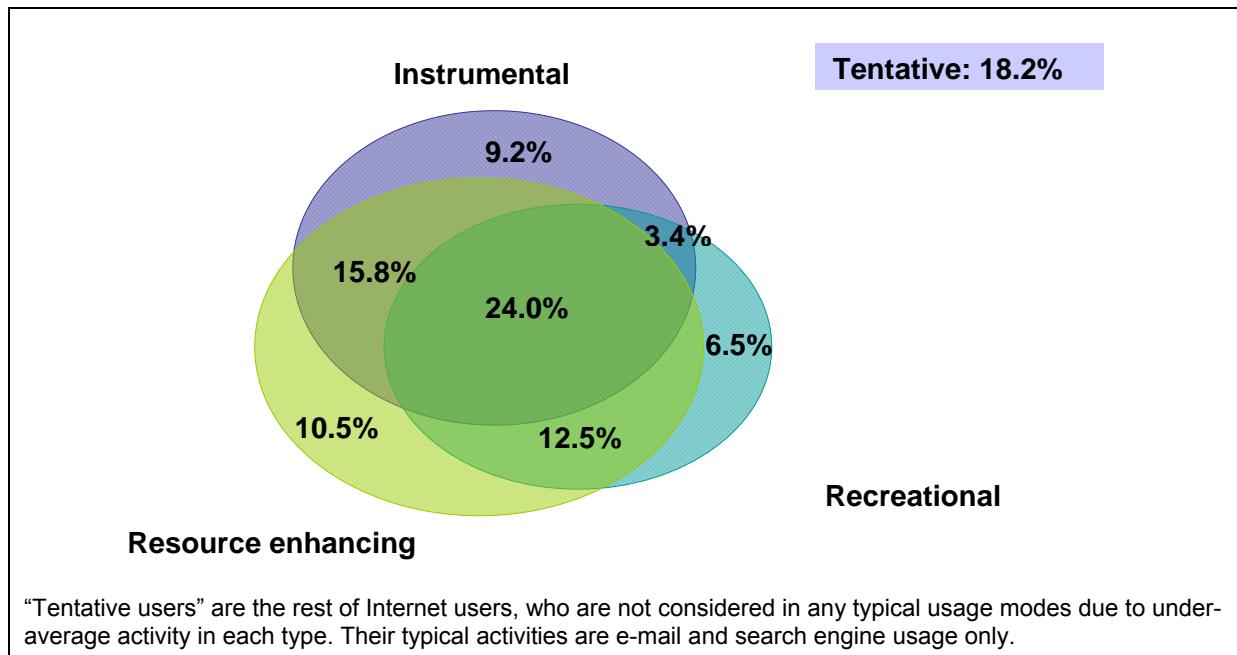
Table 1: Typology of Internet uses based on the literature

Recreation	Resource enhancing	Instrumental
Playing and downloading	Learning online	e-Banking
Sharing media	Social networking	Buying and selling
Transferring to other device	Following the news	e-Government
	Work	

Source: The authors

A person is considered to be a recreational, resource enhancing or instrumental user if she pursues more of the respective activities than the average Internet user. Average recreational, resource enhancing and instrumental uses were computed on the bases of standardised (Z-score) values of the respective activities.

As Figure 1 shows, there are overlaps between the three types of Internet use. 24% of the EU27 Internet users are classified as “all-round users”, who make not only recreational but also resource-enhancing as well as instrumental use of the Internet. On the other end of the spectrum, 18% of the online population make what may be called “tentative users” of the Internet: Typically they use e-mail and search engines only, and have not as yet engaged in more advanced applications which often require a certain degree of self-efficacy, i.e. stronger confidence in one's ability to master the hard- and software of Internet access.

Figure 1: Share of Internet users according to the type of use

Data source: Flash Eurobarometer 241

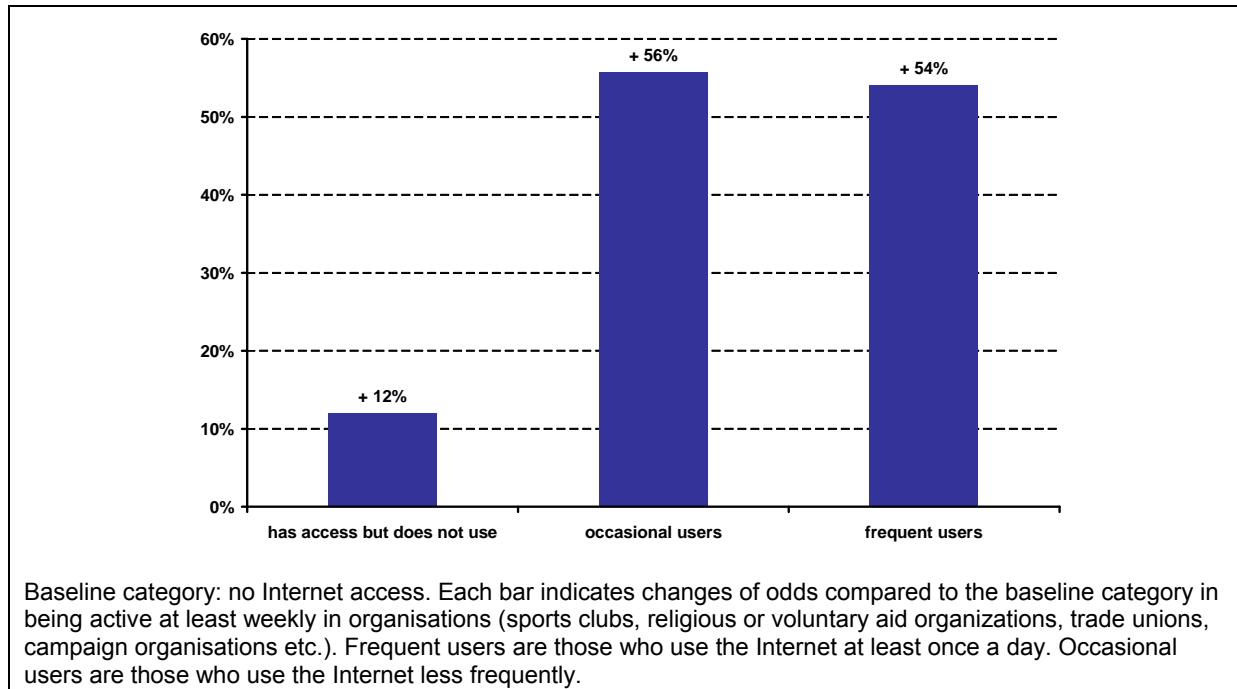
Our analysis sought to establish evidence about the relationship between patterns of Internet use on the one hand and civic participation on the other hand. The latter is understood as active participation in the activities of sports clubs, religious or voluntary aid organizations, trade unions, campaign organisations, or other organizations¹.

We found that **the very fact that a person uses the Internet is associated with increased likelihood that she or he is engaged in civic activity, independently from the effects of social background**². This finding is especially important, as scholars raised attention to potential eroding effect of ICT on face-to-face relationships; our analysis of the Eurobarometer data suggests, on the contrary, that Internet use and active engagement in the social sphere tend to go hand-in-hand.

The probability of Internet users' engagement in some civic activity is approximately one and half times higher than that of those who do not have Internet access (Figure 2). There is, however, no significant difference between occasional and daily Internet users in this respect. It does, therefore, not make any difference for the likelihood of engaging in civic participation whether the Internet is used every day or only a few times per week or month.

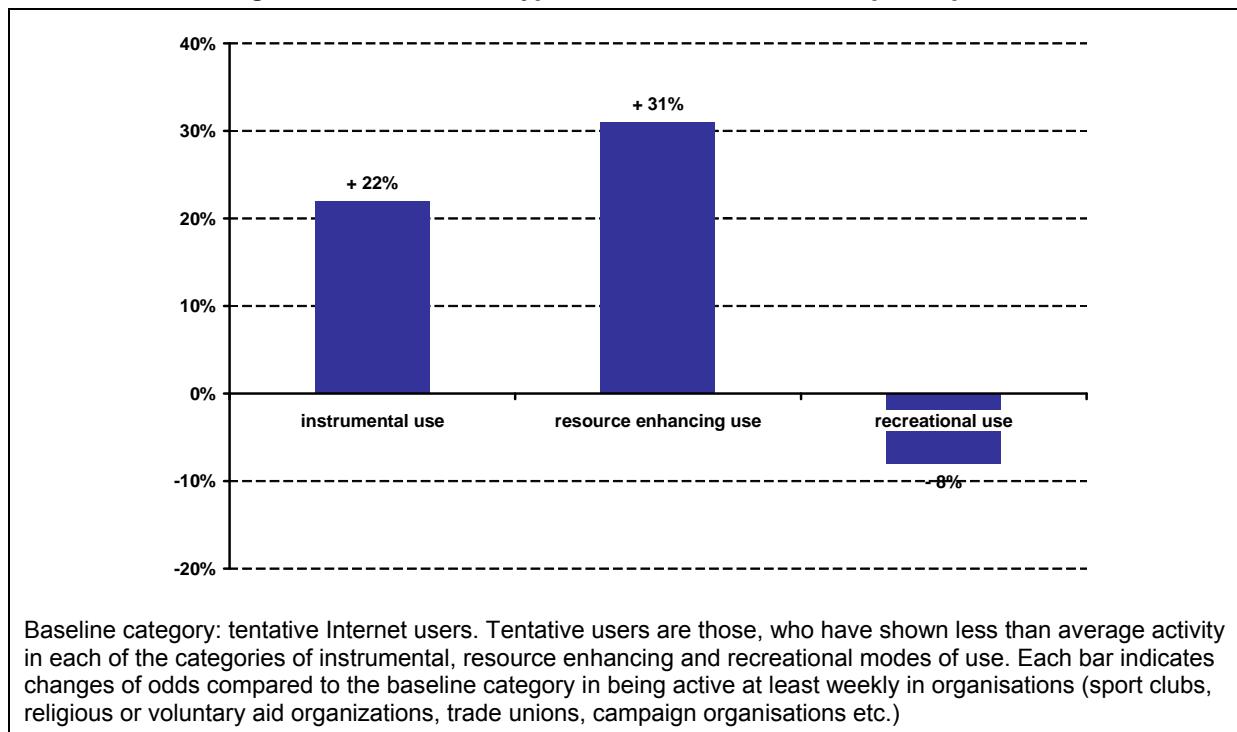
¹ The question is based on well-established data collection instruments such as the European Social Survey (ESS). Coverage of leisure oriented as well as policy oriented activities is intentional, as both are elements of social capital as operationalised for empirical investigation by Putnam (2000) and in a large number of follow-up studies (cf. Field, 2003).

² This means that the fact that there are differences in civic participation between socio-demographic groups is controlled for (by means of statistical techniques). An example for such differences is that people with low educational attainment are less likely to engage in civic participation.

Figure 2: The effect of Internet access / intensity of Internet use on civic participation

Data source: Flash Eurobarometer 241

Instrumental and resource enhancing users have an about 20% and 30% higher chance, respectively, to be active in civic organizations compared to tentative Internet users (Figure 3).

Figure 3: The effect of type of Internet use on civic participation

Data source: Flash Eurobarometer 241

While both instrumental and resource enhancing Internet uses coincide with a small, but statistically significant increase in civic participation, this is not the case for recreational Internet use (Figure 3, last column).

Internet use is also associated positively with generalised trust level: **Internet users are significantly more likely than non-users to express high rates of general trust in people.**

As it is the case for civic participation, within the category of Internet users there is no substantial difference between daily and less frequent users in terms of general trust. Again, as with regard to civic participation, **instrumental and resource enhancing Internet uses coincide with a small, but statistically significant increase in general trust.** Recreational Internet use, in contrast, is not associated with social capital either in a positive or negative direction. The effects were present independently of the social-demographic background.

These results suggest that, when it comes to explain different levels of social capital, the activities which people carry out using the Internet are as important as the fact that a person uses the Internet or not. Policy-making should, therefore, focus on fostering uptake of particular Internet applications rather than trying to increase Internet penetration rates as an end itself.

The positive association between resource enhancing Internet use and social capital is stronger in countries where Internet penetration is low, while the relationship between instrumental Internet use and social capital is stronger in high penetration rate countries.

In addition to civic participation, we analysed the extent to which respondents are involved in social leisure activities during their leisure time. Four types of social leisure activities were listed: engaging in sport and fitness; going to the cinema, a concert, theatre or other life performance, or watching live sport events; having a meal in a restaurant, café or pub, or going for a drink at a bar or club; and meeting friends.

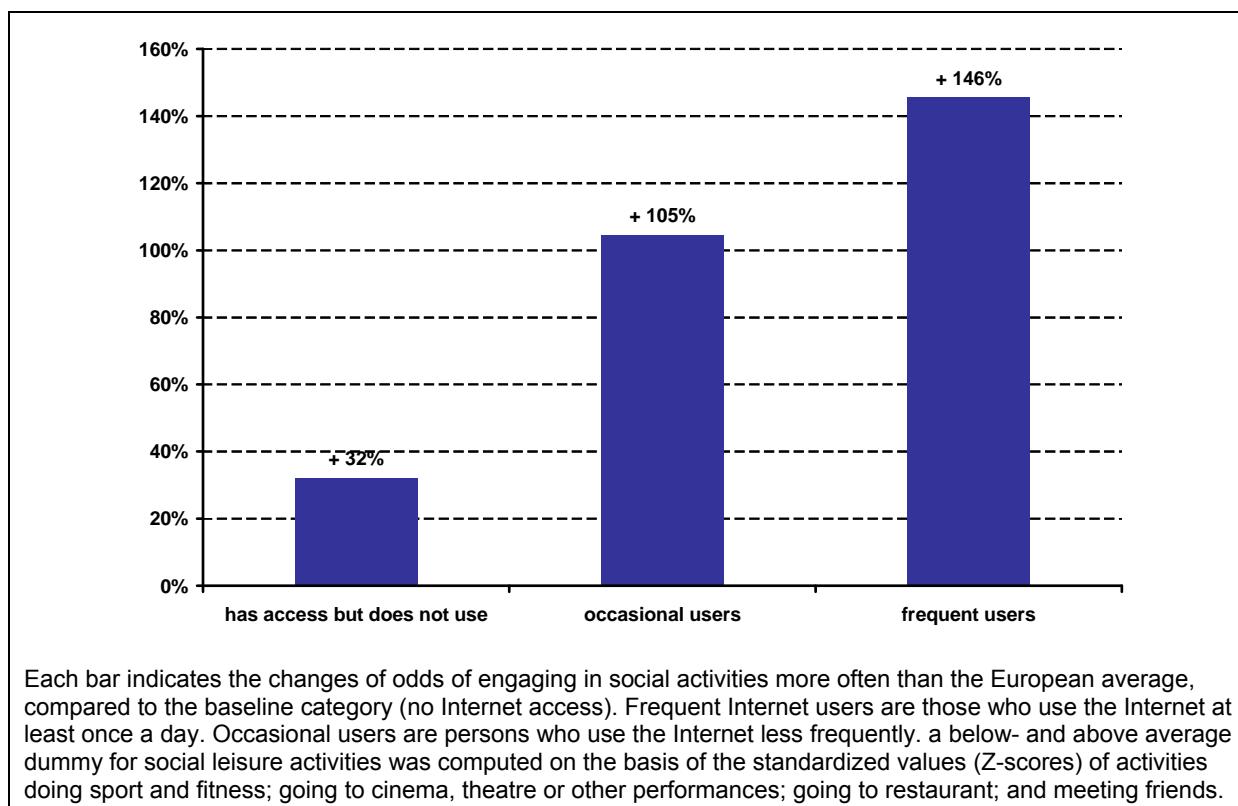
The data suggest that **Internet users are much more active in social leisure activities than non-users.** They are more likely to engage in active sport (64% do so weekly, vs. 40% among non-users), more than twice as likely to go to the cinema/theatre/other performance and also more than twice as likely to visit a restaurant/café/pub/bar/club in a given period of time. Furthermore, they also tend to meet friends more often.

Both Internet access and Internet use / intensity of use are positively correlated with leisure time spent on social activities, independently from a person's social-demographic background (Figure 4). This means that, after controlling for differences which are explained by social-demographic factors, persons who use the Internet (in particular if they do so occasionally rather than daily) are more likely to engage in social activities during their leisure time.

Resource enhancing Internet use is associated positively with time spent on social leisure activities; recreational Internet use has an even stronger positive effect.

On the other hand, instrumental use does show neither a positive nor a negative association with time spent on social activities. This result does not support the view, however, that the positive relationship to be observed between Internet use and social leisure activities is due to the fact that Internet users can perform their tasks (such as shopping or contacting the administration) more efficiently, and thereby free up time they can then use for socialising.

Figure 4: The effect of Internet access / intensity of Internet use on leisure time spent on social activities

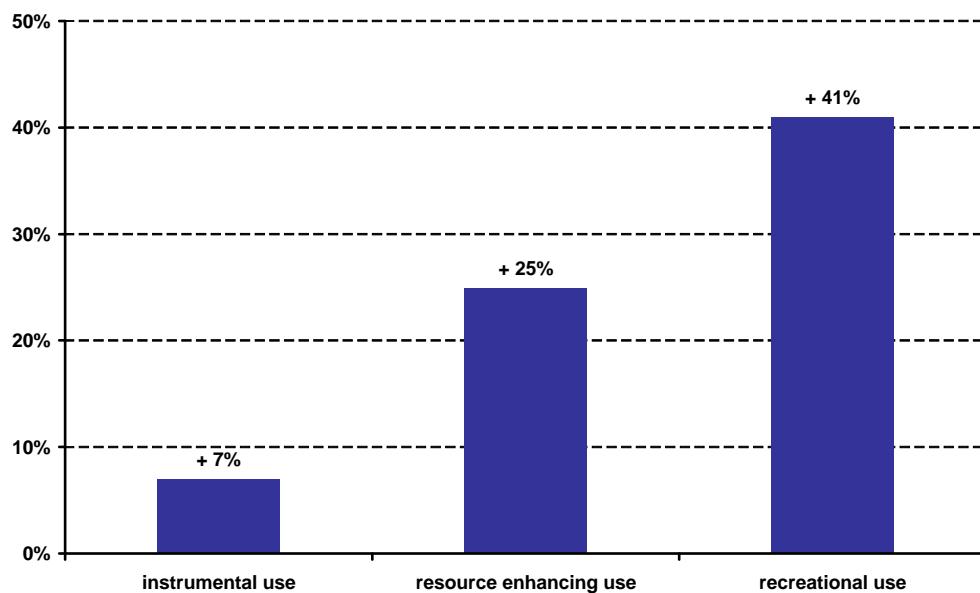


Data source: Flash Eurobarometer 241

Comparing Figure 3 with Figure 5, we can observe a clear difference: Whereas recreational Internet use is not associated with participation in groups (Figure 3), there is a strong and significant association with social leisure activities. Concerning instrumental Internet use, the picture is the other way around (significant association with civic participation, but not so with social leisure activities). Moreover, frequency of Internet use shows a significant association with social leisure activities but not so with civic participation.

These differences indicate that a distinction needs to be made, when analysing possible impacts of ICT in the social domain, between general sociability on the one hand and active participation in groups on the other hand. Different patterns of Internet use correspond with differences in the way people participate in society.

The analysis does **not** support the view, however, that the positive relationship to be observed between Internet use and social leisure activities is due to the fact that Internet users can perform their tasks (such as shopping or contacting the administration) more efficiently, and thereby free up time they can then use for socialising.

Figure 5: The effect of type of Internet use on leisure time spent on social activities

Each bar indicates the changes of odds of spending more time on social leisure activities than the European average compared to the baseline category. Baseline category is that of the tentative Internet users. Tentative users are those who have shown less than average activity in each of the categories of instrumental, resource enhancing and recreational modes of use. A below- and above average dummy for social leisure activities was computed on the basis of the standardized values (Z-scores) of activities doing sport and fitness; going to cinema, theatre or other performances; going to restaurant; and meeting friends.

Data source: Flash Eurobarometer 241

People in high penetration countries are much more active in social leisure activities than citizens of low and medium penetration rate countries, independently of whether they use the Internet or not. Thus, higher Internet penetration is associated with more social activities of non-user as well and Internet use do increase social activities at a given penetration rate additionally.

Based on earlier literature, it was expected that Internet use is related to a decrease in television watching. It was found, that television watching is more frequent among older and lower educated people who typically do not use the Internet. However **between Internet users and non-users of similar social background there is no difference in the frequency of TV watching.**

To what extent do Internet users perceive positive or negative impacts of using the Internet? Figure 6 shows the share of EU27 Internet users who agree that the Internet has had a positive impact on selected domains of their lives.

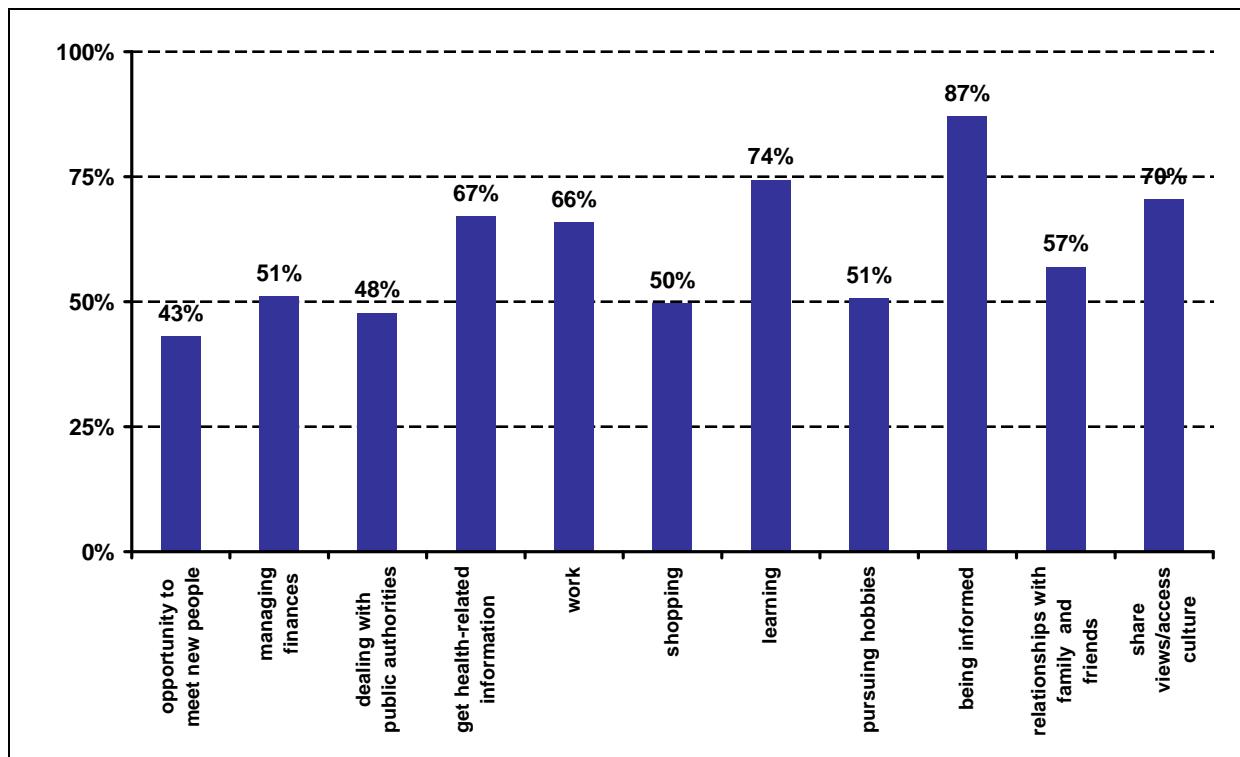
According to users' opinions, the Internet contributed to improvement of their lives especially in four domains:

- Obtaining information (Being informed about current issues: 87% agreement; Getting health related information: 67%),
- Learning (74%),
- Accessing and exchanging views about culture (70%),
- Working (66%).

In contrast, fewer than one in two Internet users feels the Internet has made it easier to meet new people (44%) and to deal with public authorities (48%). The figure is similarly low for

perceived positive impacts on the way of shopping (50%) and the way one pursues hobbies (51%).

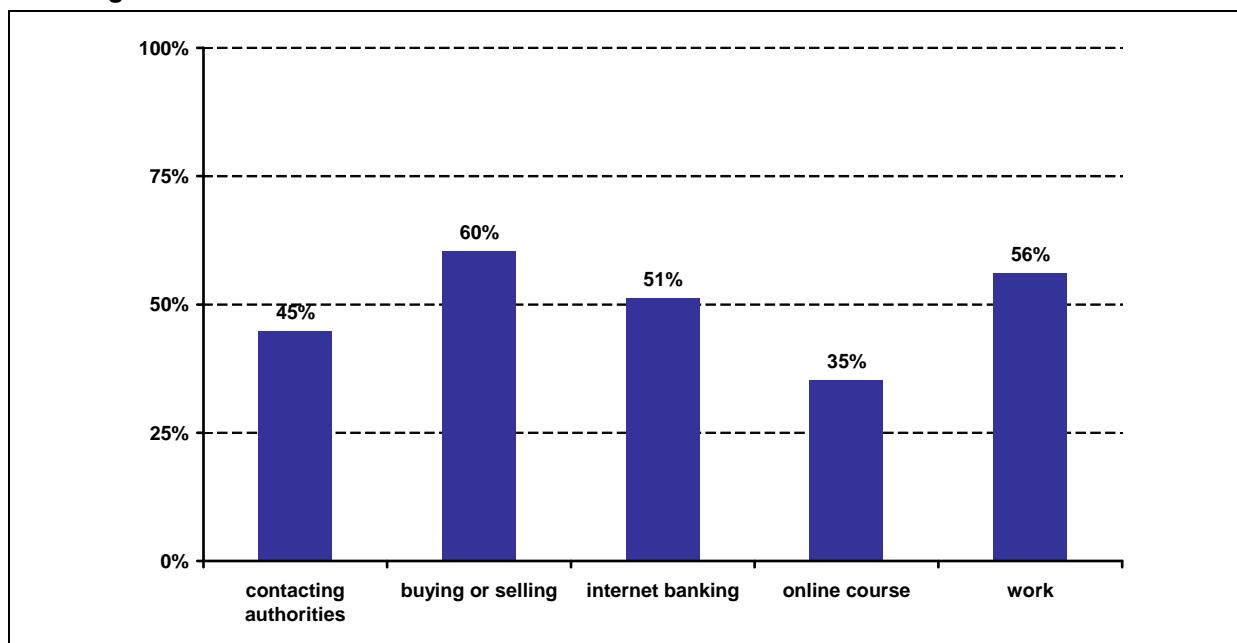
Figure 6: Proportion of Internet users agreeing that the Internet has had positive impact on selected domains of their lives



Data source: Flash Eurobarometer 241

These figures show that, while the Internet is perceived by a sizeable minority as helpful for interacting with new people, a much larger share of Internet users perceive positive impacts with regard to information retrieval, but also learning, working and accessing and communicating about cultural content. The latter activities typically include a certain element of sociability, which may explain the earlier findings according to which Internet use and sociability tend to go hand-in-hand.

The share of people who actually carried out these Internet activities (Figure 7) is close to the proportion of those who experienced improvement in their life domains. The greatest difference is between those who experienced improvement in learning and those who have participated in online courses, the latter being significantly smaller. This suggests that the Internet's positive effect on learning is not only due to new techniques (such as online learning), but also due to use of the Internet for traditional educational purposes.

Figure 7: Share of users who have at least once carried out selected Internet activities

Data source: Flash Eurobarometer 241

The survey instrument also contained a question asking respondents whether they believe that non-users would experience negative or positive effects from not using the Internet.

The majority of respondents agree that those who do not use the Internet are less reachable for professional purposes, are at disadvantage during their career, and risk missing good online shopping opportunities.

Regular Internet users are more convinced than occasional and non-users that people without Internet miss career opportunities and good bargains. Non-users, on the other hand, are more likely to report that they feel less threatened by Internet-related risks such as online fraud and unintentional disclosure of personal data.

In general we can observe a trend of users to be more convinced about the positive impacts of the Internet, and non-users putting more emphasis on the potential negative effects. This is a pattern which is often found in questionnaire research of this type, as non-users tend to justify their behaviour by claiming that there would be no reason for them to use the item in question.

We also found, that recreational and resource enhancing types of users are more likely to agree upon that ICT-use creates new opportunities.

However, our analysis also showed that **older Europeans are more likely to agree compared to younger ones that non-users of the Internet are missing opportunities** (if their social and cultural characteristics are similar). This is a significant finding as it suggests that – contrary to the popular assumption that older non-users lack an understanding of what the Internet could be good for – older people are very well aware that people derive significant benefits from using the Internet. Since a large share of them are still non-users of the Internet, this brings up the question how more older people can be enabled to fully share in the benefits from being online.

The survey data also show that **the view that users take more technical risk is more prevalent in high penetration countries**. This means that, while – at individual level – Internet use makes it less likely that a person perceives security risks, at country level high penetration rates of Internet use are associated with more widespread security concerns.

Considering mobile phone usage, we identified three typical opinions. First, that mobile phone usage contributes to **better management of leisure time**, work and security. Second, that it leads to better and **more contacts** with family members, friends and the outside world. And third, that it causes **more stress and higher costs**. As one can expect, frequent mobile users tend to considerably more agree upon the positive views. The young are less sensitive concerning stress and costs, but being other things equal they do not experience more contact benefits from mobile usage than the older generations. The lower educated people tend to be more enthusiastic about the positive effects of mobile phones, both in terms of time management and contacts.

1 Introduction

The purpose of this Topic Report is to provide statistical analysis of the Flash Eurobarometer "Information Society as Seen by EU Citizens (#241)" data on social impacts of the information and communication technologies. In addition, some related statistical data from other available information sources are reported, with the emphasis being on data from cross-country studies. First and foremost the discussion focuses on how ICTs are related to the formation of *social capital*.

Chapter 2 includes the findings from our own analysis of the data of Eurobarometer #241. Two aspects are examined in this respect: how do ICTs influence the formation of generalized trust, and what is the relationship between ICT use and civic activity. In addition to this, the conceptual framework and the domain reports highlight several possible social impacts of information technologies. One of them is how they contribute to the *structuring of daily life*; therefore this was incorporated as a second horizontal issue. The problem we are especially interested in at this point is whether the use of ICTs increases or decreases the time spent on social activities. The third topic chapter 2 discusses is *how people think about the use and lack of use of Internet*. What is the impact of the ICTs on career chances, learning, networking, getting better informed on health and other issues? What do they think about the risks related to the use of Internet? We investigate how these opinions differ according to the spread and frequency of Internet use.

The structure of chapter 2 is the following. First (in Chapter 2.1) we compare the basic ICT and social capital data at our disposal with other survey results, including the World Internet Project and the European Social Survey. Next we are going to present the breakdowns in terms of access; frequency and type of Internet use (Chapter 2.2). Then (in Chapters 2.3 and 2.4) we analyse ICT's effects regarding two horizontal concepts: social capital and daily life. Finally (in 0) we concentrate on the opinions related to the vertical domains.

In terms of the effects, cross sectional statistical analysis has serious limitations. Cross-sectional data can demonstrate relationship between two phenomena but it cannot tell the direction of causality. The last section therefore provides important material in this respect. It includes the analysis of opinion questions on the effects of Internet, namely whether it has improved specific domains of people's life. On this base we may be able to understand in a little more detail how people perceive the causal links described in the previous sections.

The focus of this project is information and communication technologies. It covers a wide range of technologies, of which this project concentrates on the effects of Internet and mobile usage. Among the diverse ICT approaches we shall investigate four aspects of the Internet. In the first place, we can differentiate between those who have and those who have no **access** to Internet. Depending on the penetration rate this might be mostly influenced by material conditions and technical constraints. The distinction between **users** and non-users has a slightly different meaning. The group of non-users includes those who have no access as well as those who do not use Internet due to lack of interest or lack of skills. Within the category of users second order differences may occur concerning the intensity (**frequency**) and **type** of use. (DiMaggio et al. 2004, Hargittai 2002)

In the analysis we concentrate on the *connections between ICT on the one hand and social capital, daily life and opinions on ITC's effects on the other*. The applied methods include frequency comparisons, cross tabulations, linear and logistic regression. Unless otherwise mentioned, data are from the Flash Eurobarometer "Information Society as Seen by EU Citizens" survey conducted in 2008 by Gallup Hungary in 27 EU-countries. The valid sample size is 27130, data are weighted according to country size with variable w5_EU27.

In addition to the general overview of the 27 EU-countries the social impacts of the ICT are investigated within three specific country groups. With this we intend to check the contextual

effect of the rate of penetration and learn what are the specificities – if there are any at all – of ICTs' social impacts at low, medium and high level of ICT use.

Our own analysis is complemented by the presentation of related findings from a number of other available data sources, which takes up Chapter 3.

The questionnaire used for Flash Eurobarometer 241 is reprinted in the Annex, which also includes a table listing secondary data sources available for analysis of the social impacts of ICTs in Europe and beyond.

2 Analysis of Flash Eurobarometer 241

2.1 Data of previous researches

Before going into details of the analysis, data from the Flash Eurobarometer are to be compared with data from other surveys. This will help to locate the observed phenomena and evaluate specificities of the collected data. Differences between indicators might be due to sampling and non-sampling differences. A typical source of non-sampling difference in cross-country survey research is the difference in the perceived meaning of phrases, notions and judgements which are implicitly or explicitly used in questionnaires.

When comparing datasets, the following most important differences must be kept in mind, which affect the results:

- Sampling method;
- Target population;
- Question wording;
- Time, when the survey was conducted.

The sampling and interviewing method of the Eurobarometer survey was telephone interviewing. In countries with a low level of fixed-line penetration additional face-to-face interviews or mobile phone interviews were included. The following table summarizes the samples by country:

Table 2: Method of interviewing (%)

	fixed phone	mobile phone	face-to-face
BE	100		
CZ	70		30
DK	100		
DE	100		
EE	70		30
EL	100		
ES	100		
FR	100		
IE	100		
IT	71	29	
CY	100		
LV	70		30
LT	70		30
LU	100		
HU	70		30
MT	100		
NL	100		
AT	80	20	
PL	70		30
PT	70	30	
SI	100		
SK	70		30
FI	7	93	
SE	100		
UK	100		
BG	70		30
RO	70		30

Data source: Flash Eurobarometer 241 "Information Society as Seen by EU Citizens"

The target group of the survey was the population aged 15 or older.

Question wording may be different between surveys, and the perception of phrases might also differ within surveys by language. Opinion research enterprises take care of the translation of the questions however to ensure their validity. Therefore, we do not expect that the same (English) questions will be translated differently in different surveys. Thus we do not expect differences in the results between international surveys due to translation when the original question wording is the same.

In order to locate the observed phenomena the most important dependent and independent variables of the analysis will be compared to external sources. Our key independent variables in the analysis are Internet access and use and the key dependent variable group is social capital.

2.1.1 Internet access and use

Internet access and use were measured in the Eurobarometer survey by a question asking how often the interviewee used the Internet in the last 3 months for personal purposes at home or elsewhere.³

The question asks explicitly about Internet use. Internet access turns out only implicitly, that is from a voluntary option because it is not formulated in the wording of the question. Additionally, Internet access in this sense does not mean home access, as it is asked in many questionnaires, but access to Internet anywhere: home, work or school and may also include public Internet access points or someone else's home if the respondent uses the Internet there.

First, the World Internet Project has been used as a comparison. The World Internet Project (WIP) is an international collaborative project that studies the social, economic and political implications of the Internet. Currently there are 28 countries covered by the research, which started in 2000 with the intention to monitor Internet's effects during its diffusion in the proceeding 10 years. (www.worldinternetproject.net)

Three EU countries participated in the WIP: the Czech Republic, Hungary and the United Kingdom. The World Internet Project Report – 2009 reports Internet use for the population aged 18 or older for the year 2007. Therefore, the EB data on Internet use in the population aged 18 or older can be computed to make them comparable with the WIP results, see Table 3.

Table 3: Comparison of Internet uptake rates in Eurobarometer and WIP surveys (%)

	EB data: Internet use (Q4=2 to 6)	EB data: Internet use (subsample of people over 18)	WIP: Internet use (individual over 18)
UK	79.8	79.0	66
CZ	70.7	70.6	50
HU	59.5	57.4	40

Data source: Flash Eurobarometer 241, The World Internet Project Report – 2009

Second, our results on Internet use will be compared to the Eurostat data. Eurostat relies on collaboration between Europe's national statistical agencies, therefore its data collection methods are not as standardized as traditional cross-sectional surveys. Eurostat publishes statistics of frequent (weekly) Internet usage for the population between 16 and 74 years of

³ In the last 3 months, how often have you used the Internet – whether at home, at work, or somewhere else – for your personal use? (READ OUT – ONE ANSWER ONLY) Several times a day, About once a day, At least once a week, At least once a month, Less than once a month, Almost Never / never, [No access to the Internet – DO NOT READ OUT], [DK/NA].

age for the year 2008, thus this indicator has been created from the EB database for the sake of comparison. Results are shown in Table 4.

Table 4: Comparison of Internet uptake rates in Eurobarometer and Eurostat surveys (%)

	EB data: Internet usage at least weekly	EB data: Internet usage at least weekly (population between 16-74 years)	EUROSTAT: Internet usage at least weekly (population between 16-74 years)
BE	71.3	76.7	66
CZ	66.6	71.0	51
DK	88.9	89.2	80
DE	66.9	71.4	68
EE	71.3	74.4	62
EL	46.0	49.1	33
ES	60.2	63.4	49
FR	70.8	76.1	63
IE	70.8	72.8	57
IT	52.2	53.6	37
CY	50.5	51.0	35
LV	60.3	63.3	57
LT	53.6	57.0	50
LU	75.7	78.4	77
HU	56.9	57.7	56
MT	57.7	60.0	46
NL	80.7	85.6	83
AT	66.5	69.5	66
PL	65.6	67.7	44
PT	49.2	52.6	38
SI	66.5	70.0	52
SK	50.7	52.0	62
FI	76.2	79.8	78
SE	80.7	80.4	83
UK	75.8	79.0	70
BG	44.6	47.3	33
RO	38.9	41.9	26
EU 27	64.3	67.3	56

Data source: Flash Eurobarometer 241, Eurostat 2008

A third source of our comparison is the European Social Survey (ESS), a European cross-national collaboration with over 30 participating countries (Jowell et al 2007). The ESS questionnaire contains a question which is almost identical to the EB question concerning Internet use. It is a minor difference that in the ESS questionnaire only home and work access are considered (the question does not include the phrase ..."or somewhere else"), and the "no access" alternative was to be read by the interviewers. The comparison of figures concerning Internet use between the ESS wave 3 (2007) and the Eurobarometer data is presented in Table 5.

Table 5: Comparison of Internet uptake rates in Eurobarometer and ESS surveys (%)

	EB data: Internet use	ESS data
BE	73.40	60.46
CZ	70.67	
DK	91.81	73.62
DE	71.25	58.85
EE	75.68	56.56
EL	50.45	
ES	63.44	40.14
FR	73.33	56.14
IE	76.20	57.17
IT	55.94	
CY	55.79	31.36
LV	63.24	
LT	59.46	
LU	80.77	
HU	59.46	32.28
MT	60.40	
NL	82.28	76.97
AT	71.14	73.18
PL	69.33	37.25
PT	51.55	28.76
SI	68.93	50.75
SK	55.47	42.81
FI	80.08	67.51
SE	84.64	77.69
UK	79.78	64.16
BG	49.35	22.57
RO	41.26	

Data source: Flash Eurobarometer 241, ESS 2007

The comparison tables show that Internet users are overrepresented in our sample in comparison with each of the three external sources. When compared with the Eurostat data the difference is higher for the low penetration countries. It exceeds 15 percentage points difference in the Czech Republic, Greece, Ireland, Italy, Cyprus, Poland, Portugal and Romania. This trend does not show when the EB and the ESS figures are compared. The difference may be the result of the telephone interviewing method – telephone and Internet access are correlated even when the social-demographic variables are controlled for, what may lead to biased estimation despite weighting by social-demographic variables.

This overestimation of the figures concerning Internet use should be kept in mind. They can be found in other EB sources as well (for example e-Communications Household Survey, 2007).

Nevertheless, general overrepresentation itself does not necessarily affect the validity of table statistics and multivariate results that have been applied to a single source, the Flash Eurobarometer data, especially not when we are judging relationships between variables.

2.1.2 Social capital

Social capital can be decomposed into different elements, some of which were measured in the survey. The EB dataset contains information about two important elements: generalized trust and civic participation.

In the EB dataset, trust was measured on an 11 level scale with the following question:

"Generally speaking, would you say that you can't be too careful in dealing with people, or that most people can be trusted?"

"Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted. Of course, you can use any number in between to express your opinion."

A question with exactly similar wording and the same 11 level scale is part of the ESS questionnaire. Therefore, the EB data can be easily compared to the ESS data (wave 3, 2007). To make the comparison easier, the following 3-level variable was created from the original 11 level scale: low, 0-3; medium, 4-6; high: 7-10.

Table 6: General trust as measured using ESS 11-point scale (%)

ESS			EB				
	<i>low</i>	<i>medium</i>	<i>high</i>		<i>low</i>	<i>medium</i>	<i>high</i>
BE	25.8	44.3	29.9	BE	14.9	42.1	43.1
CZ				CZ	36.0	46.0	18.0
DK	7.4	23.3	69.4	DK	4.2	27.3	68.5
DE	30.1	43.9	26.0	DE	24.1	43.6	32.3
EE	19.4	48.5	32.1	EE	18.4	52.6	29.0
EL				EL	40.1	35.5	24.4
ES	21.5	52.7	25.8	ES	18.8	53.0	28.2
FR	32.8	48.5	18.7	FR	25.8	52.0	22.2
IE	21.4	43.5	35.1	IE	15.6	40.1	44.4
IT				IT	12.1	47.9	40.0
CY	40.6	37.1	22.2	CY	37.0	42.9	20.1
LV				LV	26.6	49.3	24.1
LT				LT	19.0	53.6	27.4
LU				LU	23.4	49.2	27.4
HU	36.4	43.3	20.3	HU	31.3	47.8	20.8
MT				MT	30.4	46.9	22.7
NL	14.5	41.0	44.5	NL	6.4	28.3	65.3
AT	24.1	44.5	31.5	AT	19.8	44.8	35.5
PL	41.6	42.3	16.1	PL	20.8	49.3	29.9
PT	45.6	37.2	17.1	PT	24.2	53.1	22.7
SI	42.7	36.5	20.9	SI	18.5	48.1	33.3
SK	38.7	41.1	20.2	SK	34.3	46.2	19.5
FI	7.0	31.6	61.4	FI	6.2	26.3	67.6
SE	10.6	34.1	55.3	SE	8.3	32.8	58.9
UK	18.0	47.2	34.7	UK	18.3	43.6	38.0
BG	57.3	29.4	13.3	BG	40.6	40.6	18.9
RO				RO	22.4	44.4	33.1

Data source: Flash Eurobarometer 241, ESS 2007

The comparison demonstrates that trust reported in the ESS is generally lower than in the Eurobarometer dataset. Countries with a higher than average level of the difference between the two datasets are Belgium, the Netherlands, Poland, Portugal, Slovenia and Bulgaria.

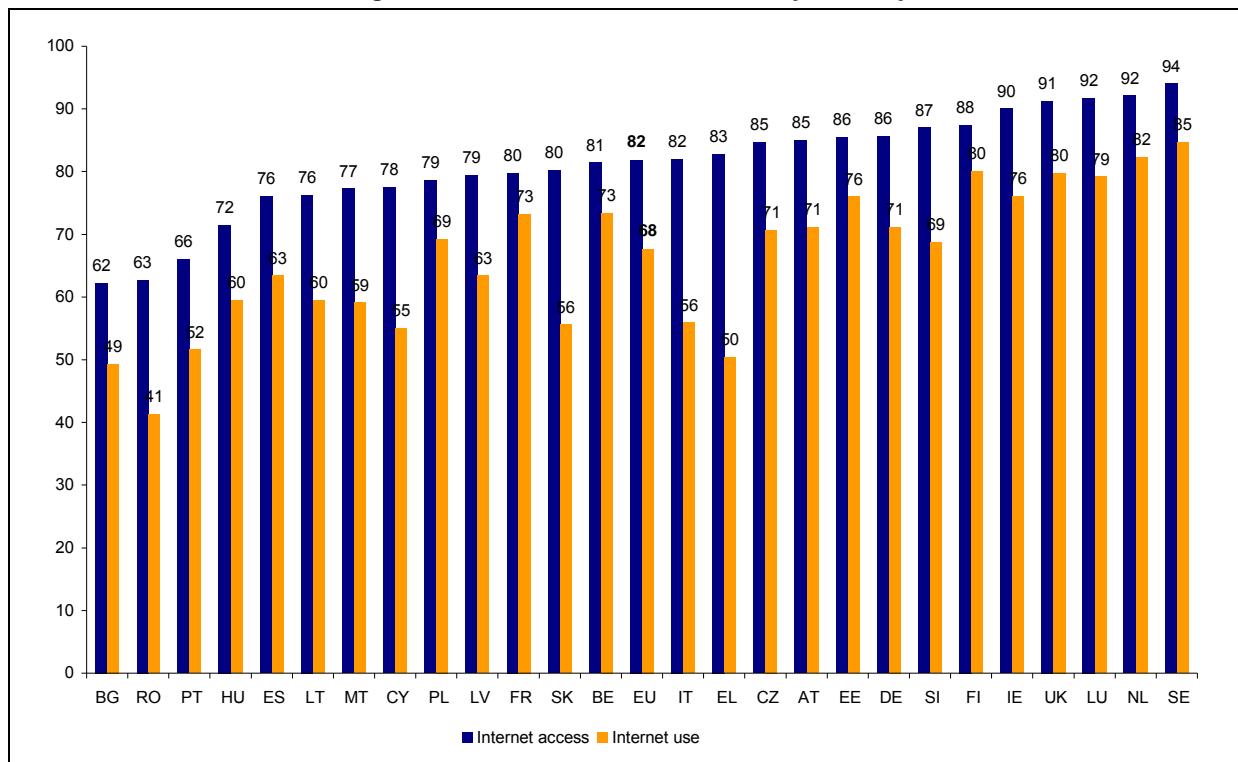
Correlation between fixed line penetration and having more than 20 percentage points difference between the two datasets is very low and not significant ($r=0.015$), therefore the differences cannot be attributed to low fixed line telephone penetration. A possible cause for the difference lies in the interview method, i.e. telephone interviews may be expected to result in higher rates of people expressing strong trust in comparison to face-to-face methods. (Shuy, 2001).

2.2 Digital divides

2.2.1 Internet access and use in the EU member states

According to the survey, 82% of Europeans above the age of 14 have access to the Internet. 68% report that they actually use the Internet. The remaining 14% have access to the Internet, but do not use it actively. In 23 of the 27 EU countries more than 75% of citizens have access to the Internet. Only the two newest member states (Bulgaria, Rumania), plus Portugal and Hungary have a lower penetration rate than this. This generally high ratio of Internet access also implies that the country differences are relatively small: the country with the highest Internet access (Denmark) has only about 1.5 times higher penetration rate than the lowest one.

Figure 8: Internet access and use by country



Data source: Flash Eurobarometer 241

The pattern of differences between countries generally follow an East-West gradient – with a few exceptions: There are two West-European countries with penetration rates similar to Eastern Europe: Spain and Portugal; and there are two small East-European states which have already overtaken many West-European ones: Estonia and Slovenia.

Wider differences between the European countries can be observed regarding actual Internet use. The proportion of Internet users in the most advanced country (Denmark) is more than double the figure in Romania.

In general Internet access and use run in parallel. However, there are some countries in which there is larger than average gap between both figures, i.e. relatively fewer of those who have access actually make use of the Internet. Most of these are South-European countries, such as Greece, Italy and Cyprus, but Romania and Slovakia belongs to this group as well.

2.2.2 Internet access and use by social-demographic background

The following Table 7 lists Internet access and use figures (in %) in different strata of society. Magnitudes of differences in these subgroups indicate the width of digital divide according to age, education, urbanisation, occupation and family type. Kendall's tau-b statistics is a measure of association⁴. These values can be compared as well. They show which one is more important from the point of view of the digital divide.

Significant social differences can be observed concerning both Internet access and Internet use in terms of age, education, occupation, household and settlement type.

In terms of age, the vast majority of the youngest generation (those under 25 years of age) has Internet access and uses the Internet (around 95%). Internet use decreases by age, it reaches 38% among the population over 55. Internet access also decreases as we move to older generations but to a smaller extent than usage figures.

Similar patterns can be observed concerning education: almost everyone who is still in education has Internet access and also uses Internet. Internet access decreases, when educational level decreases and Internet use decreases even more (thus the proportion of non-users who have access increases).

As for occupation, Internet access among manual workers is only 10 percentage points lower than among employees, but for Internet use there is more than 20 percentage points difference. Those who do not work are about 20 percentage points less likely to have Internet access than employees and are about 35 percentage points less likely to use the Internet.

It is also worth mentioning that age and education are interrelated: the latter has tended to increase gradually over the last decades. In addition occupation is clearly related to education.

Thus, social differences are larger for *Internet use* than for Internet access. It implies that generally speaking motivation, knowledge and lifestyle might be more important barriers to the spread of ICT than material constraints.

⁴ 0 indicates no relationship, -1 perfect negative, +1 perfect positive association. This indicator measures linear association: whether higher value of one variable (such as age) predicts higher value of the other property (such as Internet use). When the relationship is nonlinear (e.g. Internet use increases from younger to medium-aged citizens, and then decreases from medium-aged to older ones) its value decreases in absolute terms, as it shows only the average effect in all age groups: how much the increase in age (in all age groups) predicts an increase in Internet use.

Table 7: First order digital differences: Internet access and use within social and demographic categories (%)

		Internet access	Internet use	N
Age	15-24	96.8	94.9	4249
	25-39	92.8	87.4	6464
	40-54	87.4	70.2	7372
	55+	62.1	37.6	8605
	Kendall's tau-b	-0.317***	-0.432***	
Education (finished at the age of)	-15	55.1	23.8	3996
	16-20	81.9	66.2	11081
	20+	90.4	82.5	8063
	Still in education	97.8	96.0	3182
	Kendall's tau-b	0.281***	0.398***	
Subjective urbanization	Metropolitan zone	86.6	75.6	5934
	Other town/urban/centre	82.3	67.6	10720
	Rural zone	78.9	63.3	10300
	Kendall's tau-b	-0.070***	-0.090***	
Occupation	Self-employed	90.5	81.2	2446
	Employees	93.3	86.9	9228
	Manual workers	83.8	64.3	2009
	Not working	72.1	52.2	13251
	Kendall's tau-b	-0.233***	-0.309***	
Household type	Not single	84.3	70.5	21607
	Single	72.0	55.8	5129
	Kendall's tau-b	-0.126***	-0.124***	
EU total		81.9	67.7	27103

Data source: Flash Eurobarometer 241

2.2.3 Types of Internet use

DiMaggio et al. (2004) and van Dijk (2005) pointed out that with the diffusion of the Internet not only do social differences become manifest in property relations between the “haves” and “have-nots”, but it is also important to investigate differences *among* Internet users. Such differences might be related to:

- Online skills (Hargittai, 2002);
- Autonomy of use;
- Social support available;
- Technical infrastructure;
- Ways of use.

In the following we shall analyse whether there are social differences in the frequency and in the ways one uses the Internet.

A question in the EB questionnaire listed different activities on the Internet asking whether the respondents have ever pursued these activities (Table 8).

Table 8: Prevalence of using different functions of the Internet

Activity	% of Internet users (ever used)
E-mailing	92.5
Buying or selling things	60.3
Internet Banking	51.1
Playing, downloading media or software	48.7
Electronic administration (filling or sending forms)	44.5
Learning or doing online course	35.1
Using social networking site	31.9
Using search engine	94.1
Reading, listening or watching news	75.8
Sharing photos or videos	40.8
Using Internet for work	55.7
Transferring material to other device	52.1

Data source: Flash Eurobarometer 241

People use Internet for these purposes with different probability. There are two activities that nearly all Internet users have already done: using a search engine and e-mailing. These are not only the most widespread applications people access through the Internet, but they are also quite universal as they are used for very diverse purposes.

For the remaining major uses people make of the Internet, we require a typology in order to differentiate between applications according to their (presumed) social implications.

DiMaggio et al. (2004) suggested a distinction between economic welfare-increasing use (skill-enhancement, learning about work opportunities or consumer information), political and social capital use (following the news, engaging in civic debate, social movement activities) and recreational use. Helsper (2008) suggested a distinction between the following five fields: communication and networking; information and learning uses; financial and e-commerce uses; civic and political participation uses; and entertainment and leisure uses. She argues that offline and online capital are strongly and positively correlated. Van Dijk (2005: 1110-1113) suggests a more fine-grained classification consisting of seven “primary functions”: information; communication; work; education; business and finance; shopping; and entertainment.

For differentiation of Internet uses according to their “objective function”, it may also be useful to refer to well-established theories of media use. For example, Ball-Rokeach (1985, 1998) identified six media-system dependency goals. Jung et al. (2001), when creating an “Internet Connectedness Index”, applied these six goals to use of the Internet, resulting in the following categories:

- Two understanding goals: to stay on top of events and groups that you care about (social understanding); and to express yourself or your opinions (self-understanding);
- Two orientation goals: to accomplish business, financial, or work tasks (action orientation); and to get advice on how to deal with other people, such as doctors and other health professionals (interaction-orientation);
- Two play goals: to play or amuse yourself (solitary play); and for social reasons like making new friends (social play).

It becomes clear from this categorisation that there is no 1:1 relationship between Internet applications (such as online news, social networking) and their “objective function” from the perspective of users. Social networking, for example, can be associated with social understanding, orientation and social play goals.

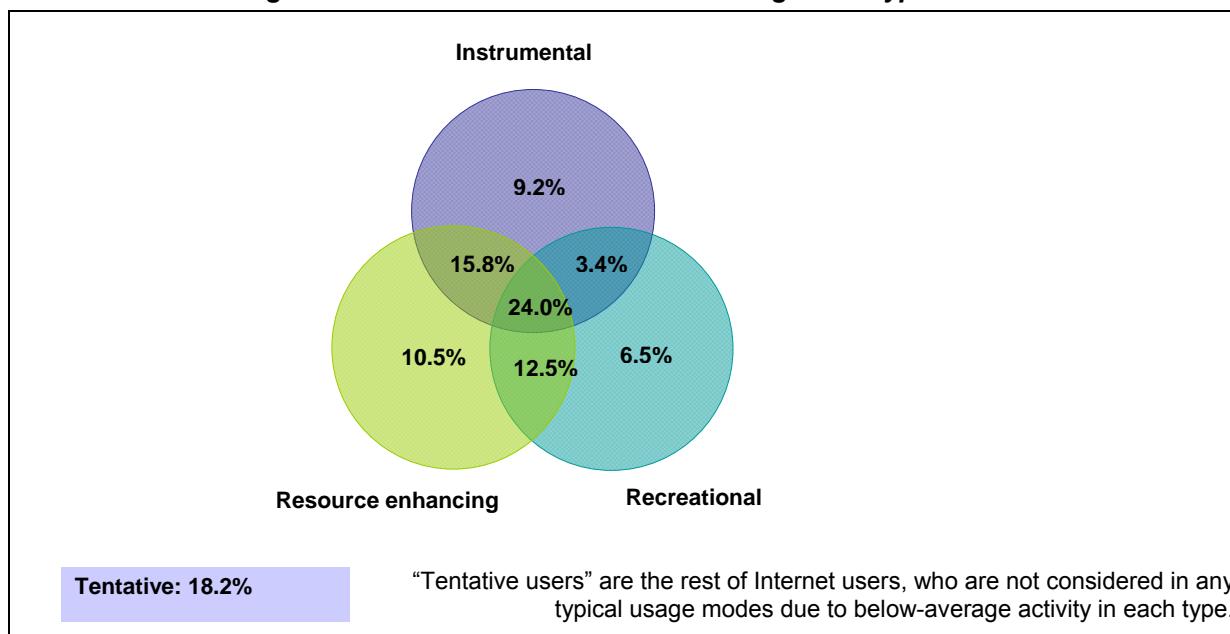
Based on the earlier attempts at classifying uses of the Internet, and with reference to the concept of social capital as discussed in D1 ("Conceptual Framework"), we shall introduce a substantive typology and separate three types of Internet use.

- The first type will be *recreation*. It is visible, that all of the above mentioned typologies include this as a separate element. Considering the list of activities mentioned in the questionnaire (Table 8) the following activities can be defined as recreation: playing and downloading media and software, sharing videos and photos, and transferring materials to other devices, such as mp3 players.
- The second type is *resource enhancement*. The typology of DiMaggio et al (2004) includes economic welfare increasing as a separate element. We extend this type to include not only economic, but social and cultural resources as well. Bourdieu (1983) argues that it is not only economic welfare, which explains social differences, but other factors are important too. One is cultural capital (the incorporated, objectified and institutionalized forms of it) and the other is social capital (which includes group membership and personal network size, one can use to gain valuable resources). Considering social capital, it was shown that different network connections offer different gains: for example close friends provide emotional aid, small services, and companionship, family members exchange financial aid, emotional aid, large services, and small services, members of the same organisations provide financial aid and companionship. (Wellman & Wortley, 1990). Considering Internet use, for the extension of economic resources, using the Internet at work is a typical example. For extending one's cultural capital on the Internet, the questionnaire mentioned e-learning and being kept informed by using the Internet for reading, listening to or watching the news which may help cognitive mobilisation (Inglehart, 1997, 1999). Extension of the personal social network is the typical activity on many social networking sites. Therefore, we included these items into the resource enhancement type.
- It is also visible, that there are other uses of the Internet, which cannot be described with the above activities. Considering these, the common element is that these uses increase the efficiency and comfort of activities of the daily life. We named this uses *instrumental use*, which includes buying and selling, e-banking, and electronic administration.

After the definition of the concepts, we have to describe the typical recreational, resource enhancing or instrumental users. As the uses of the Internet are not exclusive, we do not want to create mutually exclusive categories: an individual can use the Internet both for recreation and resource enhancing, and in any other combination.

Standardized (Z-score) values of the original variables were created for the three concepts. This provided the property that the more often pursued activities have equal weight to non-typical activities in the decision whether one can be regarded as resource enhancing, recreational or instrumental user. Average and above-average values have been coded as typical for the specific use whereas below average values have been coded as non-typical.⁵

⁵ This method provided a highly similar result to the one without standardisation: recreational and instrumental users became those, who have done at least two of the listed activities. Resource enhancing users differed in only 4% from those, who undertook at least two of the four activities.

Figure 9: Share of Internet users according to the type of use

Data source: Flash Eurobarometer 241

As mentioned before, these categories are not mutually exclusive but overlaps occur (see Figure 9). Moreover, we can find positive correlations between them (those who use the Internet for one purpose are more likely to use it for other purposes as well). 24% of the EU27 Internet users may be called "all-round users", who make not only recreational but also resource-enhancing as well as instrumental use of the Internet. On the other end of the spectrum, 18% of the online population make what may be called "tentative use" of the Internet: Tentative users typically use e-mail and search engines only, and have not as yet engaged in more advanced applications which often require a certain degree of self-efficacy, i.e. stronger confidence in one's ability to master the hard- and software of Internet access.

To check the connections between different uses of the Internet, we have carried out factor analyses⁶.

For this purpose the above-mentioned original variables have been applied with the exception of the two universal ones: they cannot be characteristic for specific uses as they are used by everyone.

The factor analysis just partly overlaps with the conceptual distinctions and separated two specific types of use. Table 9 lists the correlations between the two factors and the original variables.

The first factor, i.e. typical way of uses, includes activities mostly associated with amusement and recreation: playing games, downloading media or software, sharing photos and videos, transferring material to other device. In addition it does also include learning online and using social networking sites. That is recreation and enhancing human and social resources are not separated, but got together in the latent structure.

⁶ Factor analysis is a statistical procedure for understanding underlying structures behind variables. It creates new factors from existing variables. These factors are created to be statistically independent from each other, but to capture maximal correlation with the original variables. Thus, in our case these factors rearrange the originally correlated variables into fewer 'types' of Internet use, which are independent from each other.

Table 9: Factor analysis of activities on the Internet (maximum-likelihood estimation. Varimax rotation)

Activity	1 st factor	2 nd factor
Buying or selling things	0.206	0.657
Internet banking	0.076	0.712
Playing, downloading media or software	0.726	0.032
Electronic administration (filling or sending forms)	0.096	0.659
Learning or doing online course	0.433	0.242
Using social networking site	0.521	0.101
Reading, listening or watching news	0.442	0.372
Sharing photos or videos	0.688	0.122
Using Internet for work	0.123	0.505
Transferring material to other device	0.702	0.145

Data source: Flash Eurobarometer 241

The second factor consists of mostly market and administration related components, that is work, buying and selling, Internet banking, and electronic administration.

Each activity is presented for only one of the uses – with the exception of “following news on the net”, which is almost of equal significance in both types.

This factor analysis provides important information about how people typically use the Internet and which groups of activities usually go together. The first factor, as mentioned above, includes mostly recreational activities in addition to social networking and online learning. Online learning is not typical amusement at the first glance, although the type of learning people do in their free time is close to leisure activity and much informal learning takes place online (e.g. checking facts, looking up education about a personal interest).

In contrast, the second type includes instrumental activities, when people use the Internet for traditional purposes (which they usually do off-line as well, such as contacting administration or buying or selling things) as a tool that facilitates the everyday execution of these necessary activities.

The uses which can *potentially* help users to acquire more resources, such as knowledge (learning, kept informed), connections to people (social networking), or work are not separated in the two factors. Although their dominant effect might be the increase of resources, it is not necessary to presume that these factors always contribute to the enhancement of capabilities. Information overdose may lead to confusion, predominance of strong ties may get together with low level of generalized trust and that of work may lead to alienation. Therefore, it is especially interesting to analyse the effects of these potentially resource enhancing uses, to see, whether they actually enhance capabilities or not.

The probable reason, why the factor analysis mixed the resource enhancing uses into the two other ones may be that instrumental use is more common among older, and recreational use among younger internet users. Therefore the factor analysis connected the resource enhancing uses, which are typical for younger users (learning and social networking) to the first, and the one, which is typical for older users (work) to the second group of activities. However, the fact that some activities are often done by the similar users (such as learning and recreation) does not mean that these activities have the same consequences. Even if e-learning, getting informed and recreation may overlap, for analytic purposes it is useful to separate them. The substantial difference between the activities, and the fact that they are often done by similar users make it important to single out their separate effects. For this

purpose the multivariate regression analyses used in the subsequent sections with the large sample size of the EB is a suitable means.⁷

Therefore in the followings the effects of recreational, resource enhancing and instrumental usage of Internet are investigated separately.

2.2.4 Second level digital differences

With the help of the Internet usage typology described above, we will now put the focus on social and geographical differences in Internet use. We shall examine the frequency of use and the ways of use according to social-demographic background. Table 10 indicates the share of daily *Internet users* and the share of resource enhancing, recreational and instrumental users. As the analysed population here is that of the Internet users, the differences represent social differences within Internet user category (so called second-level digital divides).

Table 10: Second level digital differences: frequency and type of use among Internet users with different social-demographic backgrounds (%)

		Daily users	Resource enhancing users	Recreational users	Instrumental users	N (100%)
Age	15-24	82.9	74.7	74.9	38.4	4030
	25-39	80.3	65.7	50.2	65.0	5645
	40-54	71.8	55.3	27.7	55.7	5167
	55+	67.9	41.8	17.2	46.3	3234
	Kendall's tau-b	-0.121***	-0.206***	-0.379***	0.031***	
Education (finished at the age of)	-15	59.7	33.7	21.7	39.0	948
	16-20	71.9	51.7	36.6	50.1	7334
	20+	80.2	67.1	38.3	65.8	6649
	Still in education	83.9	75.9	75.8	37.8	3055
	Kendall's tau-b	0.130***	0.211***	0.226***	0.017*	
Subjective urbanization	metropolitan zone	81.0	65.3	49.7	57.7	4477
	other town/urban/centre	77.9	62.6	45.9	52.4	7245
	rural zone	71.1	54.7	35.6	50.6	4477
	Kendall's tau-b	-0.087***	-0.083***	-0.108***	-0.049***	
Occupation	Self-employed	78.5	61.8	35.7	61.8	1983
	Employees	79.5	67.0	40.3	63.3	8015
	Manual workers	64.9	41.3	38.7	46.4	1292
	Not working	74.0	56.2	49.4	40.0	6910
	Kendall's tau-b	-0.057***	-0.085***	0.091***	-0.196***	
Household type	Not single	75.9	60.5	43.9	52.1	15226
	Single	77.2	60.9	39.8	57.8	2862
	Kendall's tau-b)	0.011	0.003	-0.030***	0.041***	
Internet users (total)		76.2	60.6	43.4	53.2	18338

Data source: Flash Eurobarometer 241

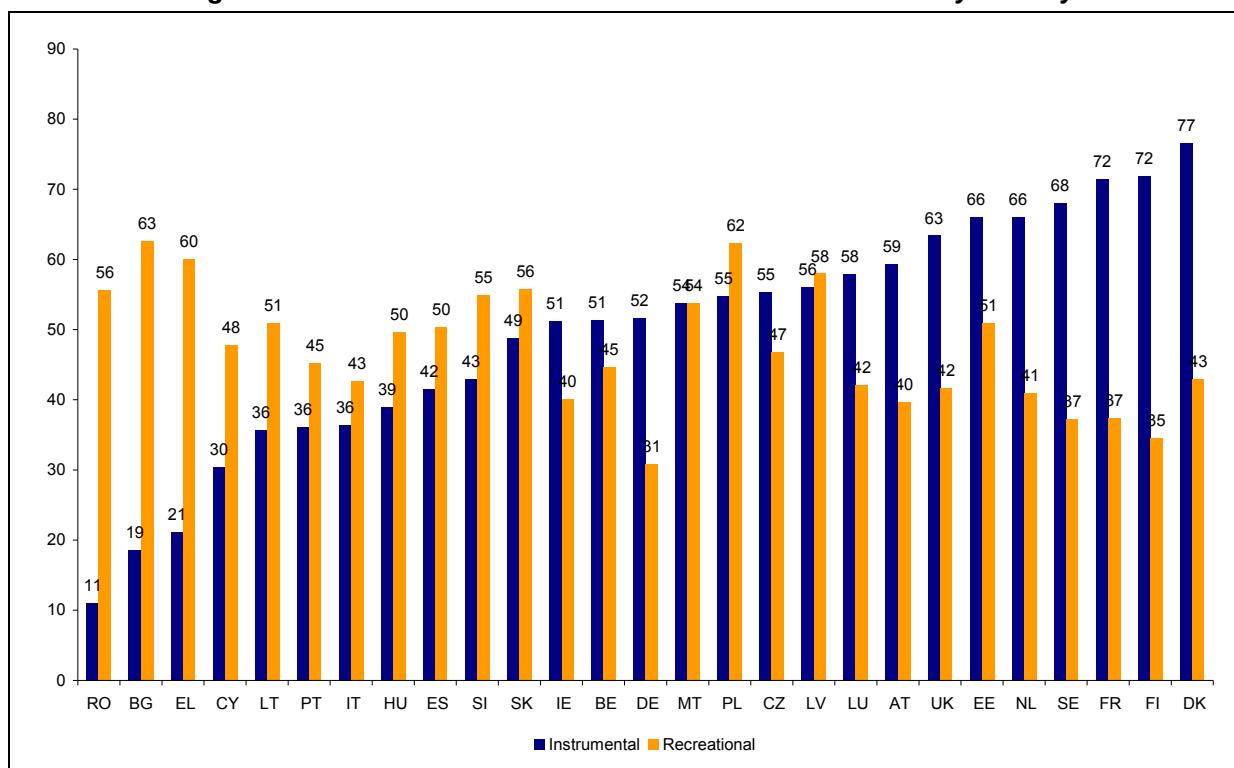
Considering the frequency of Internet use, a moderate second level digital difference can be observed in the population. Once using the Internet, younger people tend to use it more often than older people, the more educated use it more often than the less educated, and urban residents use it more often than people residing in rural areas. Non-working Internet users also show a higher frequency of usage compared to working Internet users, which may be

⁷ It is clear that the overlapping of independent variables may raise the technical problem of multicollinearity in the regression models. Therefore, we need to pay attention to test this when using the regressions later.

the consequence of the presence of students in this non-working group. No major differences can be found by household type.

Higher differences can be observed in terms of the ways of use. It is not surprising that recreational use shows strong, negative association with age of the user, but interestingly the resource enhancing mode of use also decreases with age. By contrast, this trend does not exist in the case of instrumental Internet use: Its uptake is highest in the medium aged group. Each of the three types of use increases significantly with education, which shows that people with lower levels of education tend to use the Internet for fewer and less advanced purposes. A similar, but weaker trend can be observed concerning the type of settlement: Persons residing in urban areas are more likely to make extensive rather than tentative use of the Internet. A further interesting phenomenon is that manual workers use the Internet less often for resource enhancing and instrumental purposes than employees, but the intensity of recreational use among them is almost the same. This may be indicative of the situation that manual workers are less likely to use the Internet as part of their job, and as such are less likely to learn about the manifold opportunities which the online sphere offers apart from its recreational function.

Figure 10: Instrumental and recreational use of the Internet by country



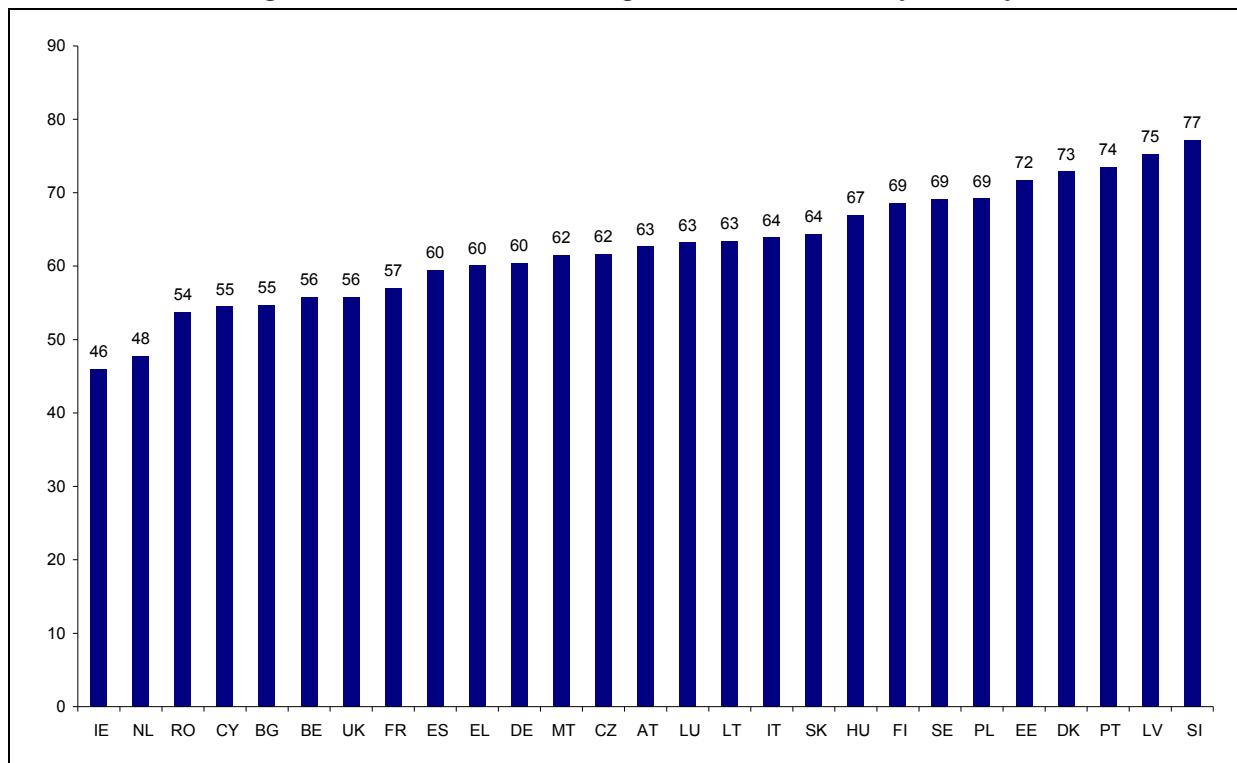
Data source: Flash Eurobarometer 241

Analysing the types of Internet usage across different countries reveals fundamental differences. The most pronounced of these are differences in instrumental use of the Internet (e-banking, buying and selling, e-government). As 53% of Europeans pursued at least two of these activities, this figure is only 11% for Rumanians, 19% for Bulgaria and 21% for Greece. The proportion of instrumental users is the highest in France and in the Nordic countries (68-72%), where overall rates of Internet uptake are also the highest.

Variance across countries is lower for recreational usage than for instrumental. Strikingly, recreational use tends to be high where instrumental use is low. The former is most widespread in South-Eastern Europe (Greece, Rumania, Bulgaria). Many East-European countries (Poland, Slovakia, Slovenia, Lithuania) also have above-average rates in

recreational use.

Figure 11: Resource enhancing use of the Internet by country



Data source: Flash Eurobarometer 241

Regarding resource enhancing use (following the news, working, learning and social networking on the Net) the differences between countries are also not as sizeable as for instrumental use. This type of use is most widespread among Internet users of the Nordic and the Baltic countries, but also in Slovenia, Portugal and Poland.

Therefore, apart from first order differences (the proportion of Internet users) a sizeable second-order difference (in the ratio of instrumental usage) can be observed among European countries. For explaining these countries differences, a number of factors have been stressed by researchers, including cultural differences regarding mentalities and preferred modes of use, and differences in the supply of attractive Internet services and content, which tend to be less developed in countries with comparatively low penetration rates. This applies to services such as governmental services (e-government), as well as private services (e-commerce, e-banking).

2.2.5 Conclusions

Digital divides indicate that people with different social background have different access to information technologies. We found that still significant digital divides exist in Europe. Internet use in the youngest generations is more than double compared to the oldest ones (95% vs. 38%). Highly educated people use the Internet with more than triple probability compared to low educated ones: (83% vs. 24%). Smaller differences can be found between people living in urban and rural areas. Manual workers are also at disadvantage in Internet use, however 65% of them already use Internet.

Furthermore, scholars raised attention that digital divides may not only be present between non-users and users, but differences can exist among users in the type and frequency of use too.

Based on previous literature, we created an own conceptual typology of Internet usage. The first type is recreation, including playing and downloading media and software, sharing videos and photos, and transferring materials to other devices, such as mp3 players. The second type we regard as instrumental use including buying and selling, e-banking, and electronic administration. The third type includes e-learning, reading the news, social networking and work, which we call resource enhancing Internet use.

Regarding the types of Internet usage, we carried out factor analysis, to check our conceptual typology. This resulted in two typical groups of activities. The first type of use includes activities mostly associated with amusement and recreation: playing, downloading media or software, using social networking sites, sharing photos and videos, transferring material to other device, but it does include learning online as well. The second factor consists of those components which are mostly related to work, buying and selling, Internet banking, electronic administration. Following news on the net was an overlapping activity, which was typical in both types. The factor analysis supported our instrumental and recreational types, however, it mixed the resource enhancing uses into these two factors. This may be due to age differences between instrumental and recreational users. As it is important to analyse the effects of resource enhancing uses separately, we decided to use the original conceptual typology.

This provided us the opportunity to analyse the second-level digital divide. We found that these differences are present in Europe: once using the Internet, older and lower educated people use it with smaller intensity. However, these second level differences are much smaller than the first order ones.

2.3 The effect of ICTs on social capital

Social capital includes mutual help, support, trust, shared norms and positive expectations between people, which help the members of the community to achieve their goals (Bourdieu, 1983; Coleman, 1988; 1990; Putnam, 2000; Sztompka, 1999; Field, 2003; Cook, 2001; Inglehart, 1997; 1999; Granovetter, 1973; Yamagishi et al., 1998). According to Coleman's (1990) definition social capital is embedded in the social structure; it is not a property of an individual. An investment to improve these relations has a positive effect on every member of the community, which means that social capital is a public good. According to other approaches (Bourdieu, 1983) individuals may also have social capital, that is personal relationships and network, which can be used for the individual's own benefit. Putnam (2001) emphasizes the civic involvement aspect of social capital. He has shown that this kind of social capital (including discussing public issues in public spaces, and membership in different civic and local organisations) contributes to better performance of the democratic institutions.

Robert Putnam (2000) argues in his widely cited and criticized book that social capital has decreased in the last decades. He emphasises, among others, the role of television in the erosion of social capital. Therefore, a vital question about the social effect of the Internet is whether Internet and social capital mutually enriched or weakened each other.

Early research on the social effects of ICTs cautioned that social relationships on the Internet are weak ones, and often anonymous ones (Kiesler et al., 1991). As strong ties play key role in maintaining social norms (Coleman, 1990), this may result in decreasing social cohesion.

Other group of researchers analysed the relationships between the Internet and the time spent with personal relationships. Some of them have found negative effect of the Internet (Nie & Hillygus, 2002), while others did not find such effect (Pronovost, 2002; Kestnbaum et al., 2002)⁸.

⁸ We provide further and more detailed overview on these studies in section 2.4.

However, later research have highlighted that Internet use has positive effect on maintaining existing social contacts (Hampton & Wellman, 2002) and that it increases social capital, as it is used for civic activities and community involvement (Kavanaugh & Patterson, 2002). Williams (2007) also demonstrated that although Internet has some displacing effect of off-line social capital, it is also a source of a different, new kind of social capital. A study on elderly users (Sum et al., 2008) found that Internet use for entertainment and information, and especially use for communicating with relatives and friends, decreases loneliness. There is evidence which indicates positive relationship between ICT use and social capital: Nurmela (2006) reported significant correlation between ICT use and components of community involvement in Finland.

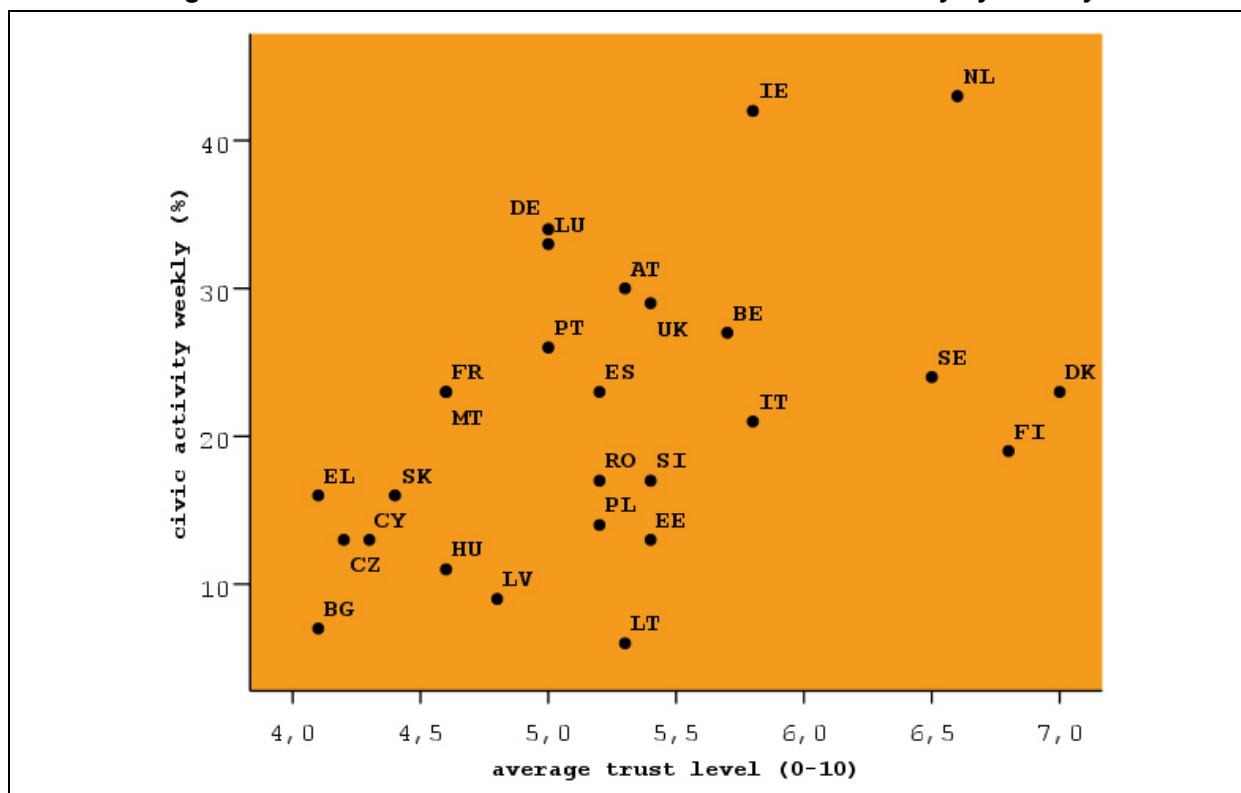
In the Flash Eurobarometer 241, civic participation is operationalized as follows. The questionnaire asks: "How often you do you actively participate in the activities of organizations, like sports clubs, religious or voluntary aid organizations, trade unions, campaign organisations etc?", with response categories "at least once a week", "less than once a week", "never". The question is based on well-established data collection instruments such as the European Social Survey (ESS). Coverage of leisure oriented as well as policy oriented activities is intentional, as both are elements of social capital as operationalized for empirical investigation by Putnam (2000) and in a large number of follow-up studies (cf. Field, 2003).

2.3.1 Trust and civic activity across Europe

Levels of civic activity and trust are two measures with which to measure aspects of social capital. At country level, there is a substantial correlation between the share of the population engaged in civic activity and the average level of trust ($r=0.46$), see Figure 12.

20 years after the collapse of state socialism, all of the ten post-socialist EU member states are found in the group of 12 countries with the lowest rates of civic activity. In addition to the post-socialist ones, Cyprus and Greece can be found in this group. Interestingly, Romania has the highest rates of active citizens among the post-socialist countries. Furthermore, there are substantial differences among the EU15. Figures in Ireland and the Netherlands highly exceed the figures in the other countries for this indicator. They are followed by Germany, Luxembourg and Austria.

Trust levels are significantly above average in the Netherlands too, but also in the Nordic countries, which did not show high levels of civic activity. Germany and Luxembourg, on the other hand, can be found among the countries with relatively low trust levels. The 12 states with lowest levels of civic activity (the post socialist plus the Greek-speaking) are below average in trust levels, as well. The Baltic countries perform relatively better regarding trust than in civic activity.

Figure 12: Correlation between levels of trust and civic activity by country

Data source: Flash Eurobarometer 241

2.3.2 Differences in social capital by social-demographic background

As both Internet use and social capital can be expected to differ between social-demographic subgroups of the population, before analyzing the relationship between ICT and social capital, we need to take a look at existing differences in social capital by key social-demographic variables (Table 11).

In civic activity interestingly the older and the youngest generations are more active than the middle aged. Engagement in civic activity has a considerable positive correlation with education, and is somewhat stronger in rural areas. Manual workers have somewhat lower social capital figures than people in the other occupation categories.

In generalized trust there are no systematic major differences by age, and there is no statistically significant difference between types of region (urban/rural). Thus, the data do not support the widespread assumption that rural areas are better in preserving the traditional communities based on trust, whereas trust is eroded in urban neighbourhoods. Social status plays a significant role: respondents with lower educational attainment and manual workers indicate substantially lower trust levels.

In general, no single linear trend can be observed for social capital according to social-demographic background. For example, although older people have the lowest trust level, civic participation is more common among them than among the working-aged population. Furthermore, civic participation is somewhat more frequent in rural areas than in urban ones.

Table 11: Social capital by social-demographic background

		Civic activity at least weekly (%)	Average level of trust (0-10)	N (100%)
Age	15-24	29.0	5.44	4249
	25-39	21.3	5.12	6464
	40-54	23.0	5.26	7372
	55+	25.1	5.19	8605
	Kendall's tau-b. F	-0.006	F=17.76 ***	
Education finished at the age of)	-15	20.7	4.78	3996
	16-20	22.7	5.02	11081
	20+	26.4	5.59	8063
	Still in education	29.4	5.66	3182
	Kendall's tau-b. F	0.059***	F=166.8***	
Subjective urbanization	metropolitan zone	23.2	5.27	5934
	other town/urban/centre	23.3	5.23	10720
	rural zone	26.0	5.21	10300
	Kendall's tau-b. F	0.027***	F=0.97	
Occupation	Self-employed	22.0	5.35	2446
	Employees	25.7	5.34	9228
	Manual workers	16.5	4.77	2009
	Not working	24.9	5.20	13251
	Kendall's tau-b. F	0.005	F=33.0***	
Household type	Not single	24.0	5.28	21607
	Single	24.9	5.02	5129
Kendall's tau-b. F		0.008	F=46.3***	
EU total		24.2	5.23	27130

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

2.3.3 Connections between ICTs and social resources: table analysis

When we compare levels of civic participation and general trust between different types of Internet non-users and users (Table 12 and Table 13), we find that the main difference lies between those who use the Internet and those who do not. Internet access itself does not have an effect: no significant differences can be found between those who do not have access and those who have access, but do not use the Internet.

While less than one-third of the non-users report that they participate in civic activities, the corresponding figure for users is almost 50%. As far as generalized trust is concerned, more than 80% of the users but only little over 70% of non-users agree, at least “to some extent”, with the statement that “generally speaking, people can be trusted”.

Among Internet users, there is no substantial difference in the social capital indicators between daily users and less frequent users of the Internet. Instrumental and resource enhancing Internet use are both associated with a higher rate of in social capital (considering both trust and civic participation) – the correlation is small, but statistically significant. On the other hand, recreational use is not associated with social capital either in positive or negative direction.

Table 12: Social capital by Internet access and use

		Internet use and access (%)			
		No access	Has access, but does not use	Uses Internet	Total
Civic participation	Never	66.0	66.7	51.7	56.4
	Less than once a week	15.0	13.5	21.7	19.4
	At least once a week	18.9	19.8	26.6	24.2
	N (100%)	4871	3844	18248	26963
	Kendall's tau-b (user vs.non-user)				0.124***
Trust	Low (0-3)	27.8	26.3	17.9	20.9
	Medium (4-6)	44.7	45.5	45.9	45.6
	High (7-10)	27.5	28.2	36.2	33.5
	N (100%)	4734	3763	18185	26682
	Kendall's tau-b (user vs.non-user)				0.105***

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

Table 13: The effect of frequency and type of Internet use on social resources

		Daily users	Resource enhancing users	Recreational users	Instrumental users	Total (Internet users)
Civic participation	Never	51.4	48.7	51.4	48.6	51.7
	Less than once a week	21.7	23.7	22.7	23.2	21.7
	At least once a week	26.9	27.6	25.9	28.2	26.6
	N (100%)	13909	10862	7810	9600	18248
	(Kendall's tau-b)	0.011	0.061***	-0.003	0.058***	
Trust	Low (0-3)	17.2	16.0	17.2	15.1	17.9
	Medium (4-6)	45.1	45.3	46.1	45.0	45.9
	High (7-10)	37.7	38.7	36.6	40.0	36.2
	N (100%)	13879	10841	7817	9603	18186
	(Kendall's tau-b)	0.054***	0.076***	0.007	0.094***	

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

2.3.4 Connections between ICTs and social resources: multivariate models

The previous analysis has indicated a positive relationship between Internet use and social capital; among Internet users, resource enhancing and instrumental users were found to be more likely to have a higher level of social capital. However, we also found some systematic effects of social-demographic background (e.g. education) on both social capital and Internet use. Therefore, below we apply multivariate regression models in order to separate these effects. These regression models are capable of representing these effects as controlled for each other, thus we can “filter out” the background effects from the examined relationships between ICT and social capital. We do check these connections within a general model covering all countries, as well as within three country-groups according to the low, medium and high penetration rate of the Internet. With these separate models we intend to check the contextual effect of the rate of penetration and learn what are the specificities – if there are any at all – of ICTs’ social impacts at low, medium and high level of ICT use.

In the subsequent analyses ICT access and use variables are coded the way that we test the effect compared to the previous category. Thus, the **frequent use** parameter shows the difference between daily users and the reference group, which is people who use the Internet

less frequently. The **occasional use** parameter shows the difference between occasional users and those who have access to but do not use the Internet. The **access but no use** parameter shows the difference between those who have access to but do not use the Internet to those without access. Thus these effects are multiplicative.

Table 14 below presents the so-called **odds ratios** for four logistic regression models. These odds ratios indicate how much the probability of participating in civic activity is higher among people with Internet access in comparison to people without access, among Internet users in comparison to people who have access but do not use it, and among daily Internet users compared to those who use it less frequently. An odds ratio of 1 signifies no effect, values over 1 signify positive, and values under 1 signify a negative effect.

Table 14: Logistic regression model on civic participation

Independent variables:		Civic participation weekly (odds ratio)	Proportion of Internet users ⁹		
			Low (-59 %)	Medium (60-74 %)	High (75 %-)
Internet	Access but no use	1.12	1.12	1.10	1.16
	Occasional use	1.39***	0.99	1.49***	1.29
	Frequent use	0.99	0.70**	1.02	1.19*
Type of Internet use (reference: tentative users)	Instrumental Use	1.22***	1.13	1.05	1.23**
	Resource enhancing use	1.31***	1.42**	1.22***	0.91
	Recreational use	0.92*	1.15	0.83***	0.97
Age (reference: 25-39)	15-24	1.39***	0.90	1.48***	1.76***
	40-55	1.24***	0.81*	1.37***	1.19
	Over 55	1.77***	1.37**	1.73***	1.77***
Education finished at age (reference: 15-20)	Less than 15	0.93	1.18	0.92	0.67
	More than 20	1.10**	1.34**	1.05	1.19*
	Student (not finished)	1.32***	1.45*	1.31**	1.31
Occupation (reference: employee)	Self employed	0.81***	0.81	0.81**	0.95
	Manual worker	0.65***	0.65**	0.70***	0.53**
	Not working	0.93	0.90	0.98	0.99
Residence (reference: other urban)	Metropolitan	0.92*	0.87	0.93	0.99
	Rural	1.19***	1.19*	1.21***	1.09
Household type	Single	1.10*	1.12	1.11*	0.95
	constant		0.18***	0.14***	0.19***

Exp (b) parameters. * p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

As the variables are not independent, the problem of multicollinearity must be checked when working with regression models. We tested multicollinearity for the explanatory variables (see the results in Annex C), and did not find results, which would make it necessary to modify the model.

The first column shows our basic model including all the EU countries. The subsequent columns represent separate models for three groups of countries according to Internet penetration.

Calculation of the basic model revealed the following results: The very fact of Internet use has a positive effect on civic activity, independently from the effect of social background. Internet users have an almost 40% greater chance to actively participate in a group/organisation compared to non-users. In addition, both the resource enhancing and the instrumental type of Internet use are positively associated with civic participation.

⁹ Country groups according to Internet penetration are the following. Low (-59%): MT, IT, SK, CY, PT, EL, BG, RO; medium (60-74%): BE, FR, DE, AT, CZ, PL, SI, LV, ES, LT, HU; high (75%+): DK, SE, NL, FI, UK, LU, IE, EE.

Instrumental and resource enhancing Internet use is associated with a 20% and 30% higher chance, respectively, to engage in civic participation when compared to the reference category, i.e. tentative Internet use.

Regarding the social-demographic variables, their effect on civic participation is to a large extent similar to the ones found in the table statistics (Table 12 & Table 13): the oldest and youngest age cohorts are more likely to be active participants in organisations. Indeed, once the effect of different rates of Internet uptake is controlled for, the elderly are shown to have an even higher likelihood of engaging in civic participation than the young. Moreover, civic activity is more common in rural areas. Education also has some positive effect on civic activity independently from Internet use, and manual workers are much less active in groups/organisations than employees.

Separate analysis for the three country groups shows that Internet use itself does not have an effect on civic participation in low penetration countries. Additionally, it can be observed that the role of resource enhancing and instrumental Internet use changes with the penetration rate. Resource enhancing use has a significant effect on the likelihood for civic participation in low penetration countries, but this effect vanishes once we turn to higher-penetration countries. Moreover, instrumental Internet use does not have a statistically significant effect in low penetration countries, while its effect increases with the Internet penetration rate.

Similar linear regression models were constructed for the analysis of general trust (Table 15). Because of the scale used for measurement of general trust, interpretation of the parameters here is different form the previous table. Here the dependent variable was the 11-point trust scale. The values in the table show the effect of the given characteristic on general trust, as measured by the average on the 11-point scale. For example, the value of 0.332 for instrumental Internet use shows that instrumental users have, on average, a value on the 0 to 10 trust scale which is 0.332 points higher than the average for tentative users. These values are also additive, thus those who use the Internet for both instrumental and resource enhancing ways, have an $0.332+0.256 = 0.588$ higher average on the 1 to 10 scale than those who do not use the Internet either ways.

The model of generalized trust does show the relative impact of frequent Internet use, as well as instrumental and resource enhancing type of Internet use on trust. These positive effects are relatively weak, but do exist even after controlling for the effect of age, education, occupation, type of region and type of household.

When the social-demographic background is taken into account, the effects as shown by the linear regression model are generally consistent with the associations found in the table analysis (Table 12 & Table 13). One exception is age: Whereas bivariate analysis lets us assume that older age was associated with lower trust levels, after controlling for the effect of other social-demographic factors as well as Internet use, we find that age actually has a positive effect on levels of general trust.

Separate analysis for the three country groups indicates that Internet access and use by themselves do have a positive effect only in low penetration countries, but not in medium and high penetration countries. Resource enhancing and instrumental Internet use show the similar pattern as for civic participation: resource enhancing use has a significant positive effect in low penetration countries, but not so where Internet penetration is high, while the picture for instrumental Internet use is the opposite.

Table 15: Linear regression model on generalised trust

Independent variables:		All countries	Proportion of Internet users		
			low	medium	high
Internet	Access but no use	0.099	0.108	0.020	-0.382*
	Occasional use	0.052	-0.038	0.143	-0.150
	Frequent use	0.133**	0.527***	-0.028	0.161
Type of Internet use (reference: tentative users)	Instrumental use	0.332***	0.160	0.215***	0.700***
	Resource enhancing use	0.256***	0.411***	0.312***	0.027
	Recreational use	-0.041	0.091	-0.039	-0.284***
Age (reference: 25-39)	15-24	0.031	-0.033	0.101	0.074
	40-55	0.378***	0.256**	0.415***	0.348***
	Over 55	0.636***	0.366***	0.641***	0.782***
Education finished at age (reference: 15-20)	Less than 15	-0.204***	-0.217*	-0.241***	-0.483***
	More than 20	0.427***	0.192*	0.492***	0.696***
	Student (not finished)	0.747***	0.053	0.901***	1.078***
Occupation (reference: employee)	Self employed	0.020	0.068	0.045	-0.078
	Manual worker	-0.216***	0.143	-0.193*	-0.278
	Not working	-0.045	0.271**	-0.131*	-0.058
Residence (reference: other urban)	Metropolitan	-0.064	-0.198*	0.130*	-0.122
	Rural	0.062	0.378***	0.126**	-0.112
Household type	Single	-0.243***	-0.189	-0.202*	-0.362*
	constant		4.379	4.153	5.486

Enter method. b parameters. * $p<0.05$ ** $p<0.01$ *** $p<0.001$. Data source: Flash Eurobarometer 241

It is also insightful to take a look at the constant levels for the three different country groups. These show how do the average trust levels differ between the three groups independently from the examined effect of Internet and social-demographic background¹⁰. It shows that high Internet penetration rate coincides with higher level of general trust. It may be due to the fact that ICT and trust mutually positively influence each other, but at the same time both of them may have common background explanatory variables as well, which are not investigated here.

2.3.5 Conclusions

Several previous studies on the relationship between ICTs and social capital warned about potential negative effect of ICTs on social capital. Their authors expressed the fear that the Internet might create only superficial relationships, and that time spent on the Internet may reduce time devoted to face-to-face relationships. Further analyses found that although this may be true, the Internet appears to create a new type of social capital when used for community involvement, and that it can also efficiently support existing face-to-face relationships by acting as an additional communication device, therefore increasing stocks of social capital.

Our analysis did not find a negative effect of Internet use; indeed, our evidence suggests that the effect is, if anything, a positive one. We found that Internet use is associated with stronger face-to-face civic involvement and frequent Internet use is associated with a higher level of generalised trust.

The new element in our analysis is the examination of the effect of type of Internet use on social capital. We found that resource enhancing and recreational ways of Internet use are associated with further increases in civic involvement and trust. On the other hand,

¹⁰ More precisely, the constants show the average trust levels for the reference categories, i.e. persons aged 25-39 who are non-manual employees and without Internet access, who finished education between age 15 and 20, and who live in an urban neighbourhood in a household consisting of more than one person.

recreational Internet use does not have a further effect either in negative or positive ways (beyond the positive effect of Internet use itself). These effects were present independently from the social-demographic background.

An interesting finding in the analysis was that resource enhancing Internet use had a more positive effect on social capital in those countries where Internet penetration was low, while instrumental Internet use had a greater effect in high penetration countries

Additionally, we found that high Internet penetration itself is related to greater trust level in the society. Not only that Internet use does coincide with greater trust level of users, but it is associated with higher trust level of non-users as well due to contextual effects.

Our findings, therefore, clearly do not support worries about negative effects of Internet use on face-to-face social capital. The fact that stronger recreational use is not associated with substantially weaker civic involvement – even if compared to general users – raises doubts about the Internet substituting for face-to-face contacts. It appears more plausible that Internet use substitutes for time spent on other non-social activities, such as TV watching – as observed by Lengyel et al. (2006) and also supported by findings of Nie & Hillygus (2002). Moreover, the fact that resource enhancing Internet use is associated with stronger civic involvement indicates that online networking (use of social networking sites) reinforces offline relations, instead of substituting for them. We can assume that the Internet as a communication medium is used to support offline activities of existing offline civic associations. This is additional to the emergence of new, online communities and associations. Therefore, it appears that indeed the Internet does not decrease, but increase offline social capital as well.

The clear limitation of this analysis is that it is based on cross-sectional analysis. Using cross-sectional data we cannot say that ICT has a one way enhancing effect on social resources, because this can be the other way around too. Maybe those who have less social resources are the ones who do not have the opportunity or motivation to use ICTs, while those who are rich in social resources might be more motivated for using the Internet more frequently. It is also plausible that Internet penetrates easier in societies with higher social capital. In fact, most of the available analyses of the digital divide suggest that the interrelation is one of reciprocal amplification (cf. van Dijk, 2005, Lengyel et al. 2004).

2.4 ICT and social leisure activities

The Internet's effect on social leisure activities is not evident at first glance; there would be reasons to expect negative as well as positive associations, depending on the assumptions used. On the one hand, people have finite amount of time, of which a significant part is bound with work and physiological activities, so the time spent in front of the Internet excludes the possibility of spending that time on offline sociability. On the other hand, ICT increases the range of available alternatives, not only in products and services, but also in activities and contacts. Widening choice opportunities may result in finding more attractive alternatives, which may induce investing more time, effort and passion in these activities.

Sociological research set up two hypotheses regarding the relationship between Internet use and time spent on sociability. Kestnbaum et al. (2002) presumed that Internet substitutes for activities which are functionally equivalent to them, such as face-to-face social activities (time displacement hypothesis). According to the efficiency hypothesis, however, Internet use increases the efficiency of other activities, which can result in more time left to spend on offline sociability (Nie & Hillygus, 2002).

These hypotheses were tested using time budget surveys in several studies. Nie & Hillygus (2002) found that location and timing of Internet use determines how social activities are affected. Internet use at home has a negative effect on time spent on offline sociability. On the other hand, they found that time spent on watching television has a more negative effect

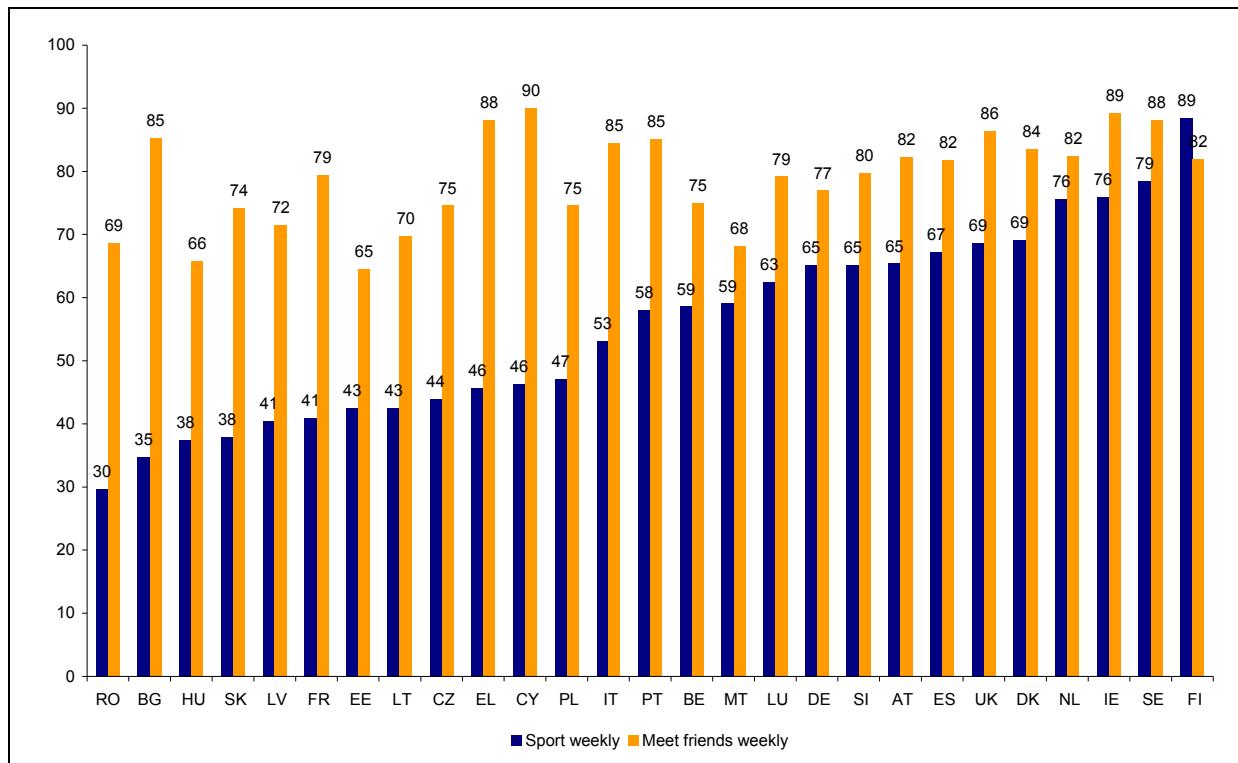
of this kind than time spent in front of the Internet. Qiu et al. (2002) found that the most visible difference between Internet users and non-users is time spent on work: heavy Internet users spend less time on paid work, which means that time spent online is not associated with less contact with family members, relatives or friends. Pronovost (2002) differentiated the effect of Internet use on social activities in general and on the same day. Same day Internet use was found to decrease time spent on social activities, while no such relationship was found when effect were observed over the longer term. Gershuny (2002) used panel data to test Internet's effect on sociability. He analysed changes in the time use of persons who were not using the Internet in the first year, but had taken up the Internet in the second year. He found no notable differences between the two points in time, which raises doubts about negative effects of Internet use on time spent on social activities. Kestnbaum et al. (2002) also did not find significant effects of Internet use on time use patterns, but they identified a displacement effect between time spent watching television and social activities. Shklovsi et al. (2006) found that heavy Internet use is associated with smaller likelihood of visiting family or friends on a randomly selected day using panel data of 2000-2001.

Below we will follow a similar strategy for investigating the relationship between Internet and social leisure activities as we did in the previous chapter when analysing social capital (civic participation and general trust). We will first consider differences in time spent on social activities according to social-demographic factors. Next we will analyse the relationship between ICT and social leisure activities by table statistics. Afterwards we will use a number of multivariate regression models to explore ICTs' effect on social leisure activities independently from the influence of social-demographic background variables.

2.4.1 Social leisure activities in Europe

The questionnaire provided the opportunity to analyse four types of social leisure activities: doing sport and fitness, going to cinema, theatre or other performances, going to restaurant, and meeting friends.

Considering country level differences of social activities, the highest differences can be observed in doing sports (Figure 13): only 30% of Romanians against almost 90% of Finns engage in active sports at least weekly. Countries where the majority do sports regularly are the same which showed high trust levels: The Netherlands, Ireland, Finland, Sweden and Denmark. There is also a general trend that post-socialist countries can be found at the bottom of the list. Considering Western Europe, regular sport is the less popular in France, which can be found on the 6th place of the list from the bottom.

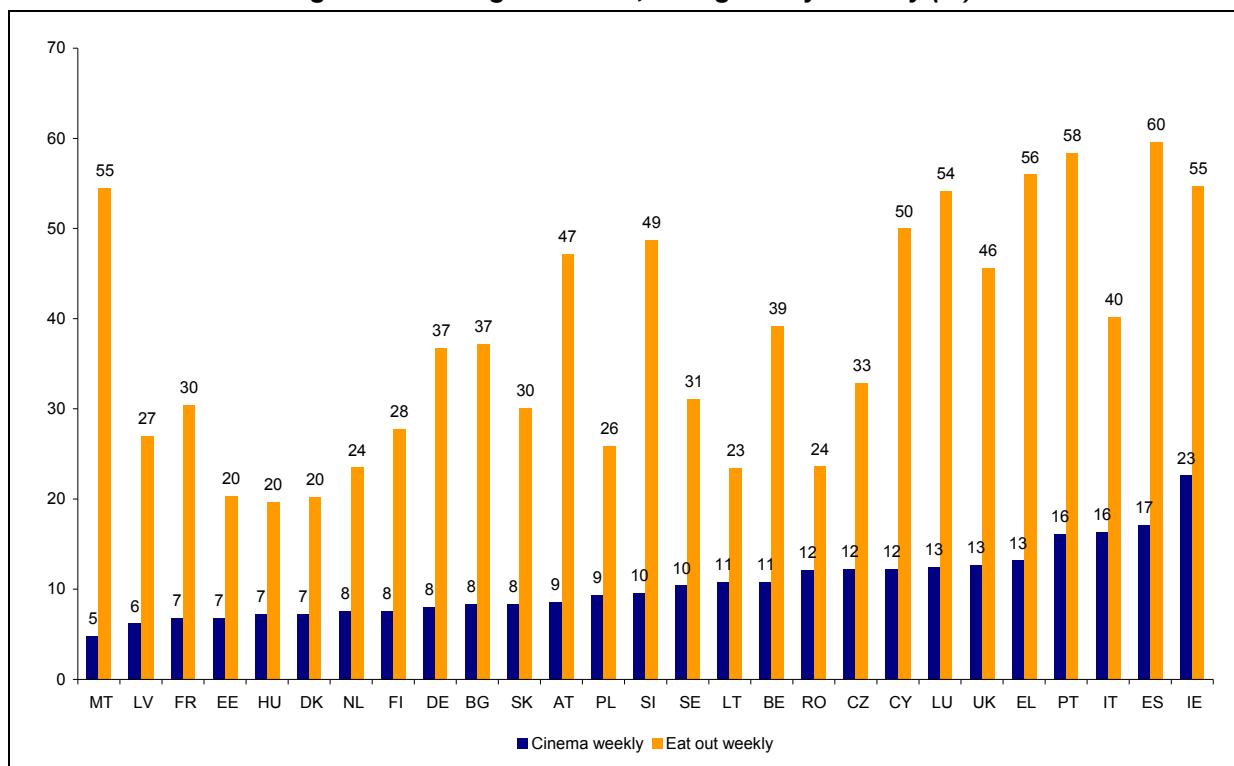
Figure 13: Doing sports and meeting friends by country (%)

Data source: Flash Eurobarometer 241

When looking at the shares of interviewees reporting that they meet friends regularly, again the post-socialist countries strike out. Nine post socialist countries constitute the bottom of the list. The only exception from this rule is Bulgaria, which can be found in the upper half.

The results concerning attending cinema, theatre and other performances have some interesting characteristics. It is most popular in Ireland, followed by the four southern European states: Spain, Italy, Portugal and Greece. Contrary to the general stereotypes, France can be found at the bottom of the list. The Netherlands, Denmark and Finland can also be found on the bottom third of the list.

Going to restaurants shows similar pattern to visiting cinema, theatre or other performances. Thus, the above patterns can be observed except that France is in the mid range in this aspect (not in the bottom) and that Italy is also in the middle (not in the top).

Figure 14: Going to cinema, eating out by country (%)

Data source: Flash Eurobarometer 241

2.4.2 Social leisure activities by social-demographic background

After analysing these activities separately, we also created a composite measure of social leisure activities. We standardised the values of these activities and afterwards summarised the four values. Based on this composite measure, we separated the population into two groups of almost equal size: respondents whose engagement in social leisure activities was below average, and those whose was above average.

Table 16 considers both the separate and the composite measure. The first four columns represent how much of the given population carries out the four social leisure activities at least weekly. The fifth column represents the proportion of the given population who are more engaged in social leisure activities than the average. The last column tells us how many people belonged to the given social group in the sample.

Kendall's tau-b statistics indicate the direction and strength of association between the social background and social leisure variables.¹¹

The results indicate a strong association between, on the one hand, social leisure activities and, on the other hand, age as well as education. The likelihood that a person engages in each of the four activities decreases substantially with age, while the probability for each of them increases substantially with educational attainment. A similar trend is observed considering type of region (urbanisation), although differences are much smaller in this respect. Manual workers also tend to have lower likelihood to engage in social leisure activities than (non-manual) employees.

¹¹ See description in section 2.2.1.

Table 16: Social leisure activities by social background (in %)

		Sport	Cinema	Eating out	Meeting friends	Social leisure activities above average	N (100%)
Age	15-24	76.8	23.0	59.1	95.6	85.2	4249
	25-39	58.4	11.3	45.1	84.0	58.1	6464
	40-54	52.0	9.1	34.4	77.3	45.7	7372
	55+	48.8	6.8	25.5	71.6	33.6	8605
	Kendall's tau-b	-0.156***	-0.137***	-0.217***	-0.182***	-0.306***	
Education finished at the age of	-15	39.8	5.1	23.0	69.6	25.7	3996
	16-20	52.2	8.9	34.6	78.5	45.2	11081
	20+	62.4	12.7	42.4	82.1	58.9	8063
	Still in education	79.6	23.2	58.7	96.0	86.6	3182
	Kendall's tau-b	0.203***	0.137***	0.179***	0.150***	0.299***	
Subjective urbanization	metropolitan zone	60.1	13.6	45.0	81.1	57.9	5934
	Other town/urban/centre	57.2	11.6	38.2	80.6	52.3	10720
	rural zone	53.8	9.2	33.3	78.8	46.0	10300
	Kendall's tau-b	-0.046***	-0.052***	-0.084***	-0.023***	-0.086***	
Occupation	Self-employed	58.4	14.0	50.3	81.6	58.5	2446
	Employees	60.4	11.8	42.3	82.7	57.7	9228
	Manual workers	40.3	7.2	34.3	78.7	40.2	2009
	Not working	56.1	10.8	33.1	78.2	46.9	13251
	Kendall's tau-b	-0.030***	-0.024***	-0.108***	-0.046***	-0.096***	
Household type	Not single	57.2	11.4	37.8	79.9%	51.8	21607
	Single	54.0	10.0	38.4	80.3%	48.4	5129
Kendall's tau-b		-0.026***	-0.018**	0.005	0.003	-0.027	
EU total		56.5	11.1	37.9	80.0	51.1	

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

2.4.3 ICT and social leisure activities

Based on Table 17 we analyse below the relationship between Internet access/use and social leisure activities.

The table shows that the main difference in terms of social leisure activities is between Internet users and non-users. There are only some small differences between respondents who have no access, and respondents who have access but do not use the Internet. Internet users are much more engaged in social activities than non-users. More of them do sport (64% of them weekly vs. 40% on non-users), go to the cinema, and go to a restaurant or pub frequently (their figures for going weekly to the cinema or similar and for visiting a restaurant or similar are more than twice as high as the figures for non-users). They are more likely to meet friends often as well.

Table 17: Social leisure activities by Internet access and use

		Internet use and access (%)			
		No access	Has access, but does not use	Uses Internet	Total
Sport	Less than weekly	60.8%	58.2%	35.9%	43.5%
	At least once a week	39.2%	41.8%	64.1%	56.5%
	Kendall's tau-b				0.214***
Going to cinema, theatre, performances	Less than weekly	94.6%	93.6%	86.4%	88.9%
	At least once a week	5.4%	6.4%	13.6%	11.1%
	Kendall's tau-b (user vs.non-user)				0.111***
Eating out	Less than weekly	79.6%	74.6%	54.8%	62.1%
	At least once a week	20.4%	25.4%	45.2%	37.9%
	Kendall's tau-b				0.211***
Meeting friends	Less than weekly	30.8%	29.4%	15.2%	20.0%
	At least once a week	69.2%	70.6%	84.8%	80.0%
	Kendall's tau-b				0.167***
Social leisure overall	Below average	76.4%	71.1%	37.2%	48.9%
	Above average	23.6%	28.9%	62.8%	51.1%
	Kendall's tau-b				0.331***
	EU total (N)	4911	3853	18338	27130

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

Next we examine whether further differences exist when we distinguish between occasional and frequent Internet users and between types of Internet users (Table 18).

The table shows that, indeed, there are further differences in social leisure activities between occasional and frequent Internet users and between types of Internet users.

A somewhat larger share of frequent Internet users is engaged in social activities regularly; especially eating out is more common among them.

As for the type of use, instrumental use is not, or only slightly associated positively with social leisure activities. On the other hand, resource enhancing and recreational users are more engaged in social activities than other users. It can be observed that the share which is engaged in social leisure activities is always the highest among recreational Internet users. This effect is generally true for each of the examined activities, although the extent of difference varies. Doing sport, going to the cinema or other performances and meeting friends weekly is at about 5 percentage points higher among recreational users compared to all Internet users, while the difference is 10 percentage points for visiting a restaurant or similar establishment.

Table 18: Social leisure activities by frequency and type of Internet use

		Daily users	Resource enhancing users	Recreational users	Instrumental users	Total (Internet users)
Sport	Less than weekly	35.0%	32.9%	32.0%	34.1%	35.9%
	At least once a week	65.0%	67.1%	68.0%	65.9%	64.1%
	Kendall's tau-b	0.033***	0.077***	0.068***	0.039***	
Going to cinema, theatre, performances	Less than weekly	85.2%	83.7%	81.8%	86.6%	86.4%
	At least once a week	14.8%	16.3%	18.2%	13.4%	13.6%
	Kendall's tau-b	0.066***	0.096***	0.115***	-0.005	
Eating out	Less than weekly	51.6%	49.4%	45.2%	53.8%	54.8%
	At least once a week	48.4%	50.6%	54.8%	46.2%	45.2%
	Kendall's tau-b	0.114***	0.131***	0.167***	0.021**	
Meeting friends	Less than weekly	13.4%	13.3%	10.1%	15.0%	15.2%
	At least once a week	86.6%	86.7%	89.9%	85.0%	84.8%
	Kendall's tau-b	0.089***	0.060***	0.122***	0.001	
Social leisure overall	Below average	34.1	30.8	26.1	35.4	37.2%
	Above average	65.9	69.2	73.9	64.6	62.8%
	Kendall's tau-b	0.114***	0.159***	0.189***	0.037***	
EU total						

* $p<0.05$ ** $p<0.01$ *** $p<0.001$. Data source: Flash Eurobarometer 241

2.4.4 Multivariate analysis

The question arises, whether the positive association between Internet use and social leisure activities is due to social-demographic factors or whether it exists independently. To test this, we ran a number of logistic regression models. As the previous analysis did not find major differences between the four social activities, here we analyse only the composite measure of social leisure activities (

Table 19). The parameters in the models are again odds ratios, which express how much the probability of being more than average engaged in social leisure activities is higher among respondents with Internet access than among respondents without access, among Internet users than among people who have access only, among daily Internet users compared to occasional users, etc.

The basic model considering all the EU countries can be found in the first column. The other columns present the findings for the three country groups (countries with low, medium and high Internet penetration, respectively).

Table 19: Logistic regression models on Internet's effects on social leisure activities

		Dependent variable: social leisure activities above average	Proportion of Internet users		
			Low (-59%)	Medium (60-74 %)	High (75 %-)
Independent variables:					
Internet	Access but no use	1.32***	1.55***	1.22**	0.88
	Occasional use	1.55***	1.37**	1.56***	1.58***
	Frequent use	1.20***	1.14	1.17**	1.29**
Type of Internet use (reference: tentative users)	Instrumental use	1.07	1.32**	0.94	1.19*
	Resource enhancing use	1.25***	1.88***	1.17**	1.15
	Recreational use	1.41***	1.23*	1.52***	1.28**
Age (reference: 25-39)	15-24	2.94***	1.83***	3.82***	2.96***
	40-55	0.84***	0.71***	0.93	0.70***
	Over 55	0.85***	0.69***	0.85**	0.83
Education finished at age (reference: 15-20)	Less than 15	0.76***	0.75***	0.84**	0.57***
	More than 20	1.40***	1.31***	1.65***	1.13
	Student (not finished)	2.38***	3.10***	2.30***	1.48*
Occupation (reference: employee)	Self employed	1.19***	1.43***	1.12	1.21
	Manual worker	0.71***	0.75*	0.80**	0.60**
	Not working	0.78***	0.98	0.77***	0.71***
Residence (reference: other urban)	Metropolitan	1.01	1.08	1.08	1.00
	Rural	0.89***	0.86*	0.95	0.90
Household type	Single	1.26***	1.08	1.25***	1.37***
	Constant		0.38	0.37	0.97

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

Considering Internet use, we found that both Internet access itself, and Internet use together with intensity of use is positively associated with engagement in social leisure activities, independently from social-demographic background.

Resource enhancing Internet use increases the likelihood that a person engages in social leisure activities; recreational Internet use has an even bigger positive association with these activities, independently from social-demographic background.

Furthermore, differences in social leisure activity according to social-demographic factors also exist independently from Internet use. Here the patterns do not differ from the ones we observed in the table analysis: both being younger and being better educated greatly increase the likelihood that a person is engaged in social leisure activities. Additionally, manual workers are substantially less likely to participate in social leisure activities, and people living in rural areas participate in social leisure activities somewhat less often than urban citizens. What only appears in the logistic regression model (but not in the earlier table analysis) is that people living in single-person households are more likely to be socially active than people living together with others, after controlling for the effect of other social-demographic characteristics and Internet use.

Taking a look at the country groups, we see that the effect of internet access is stronger in low penetration countries, but do not exist any more at high penetration levels. On the other hand, in high penetration level countries daily use is the factor, which is associated with higher sociability, while at low penetration levels there is no such difference between frequent and occasional users. The effect of types of Internet use on sociability also differs somewhat between groups of countries. Resource enhancing use has the strongest positive

effect in low penetration countries, similarly to what we found for social capital. On the other hand, recreational Internet use has a positive effect in each country grouping; its contribution to social leisure activities is the highest in medium penetration countries.

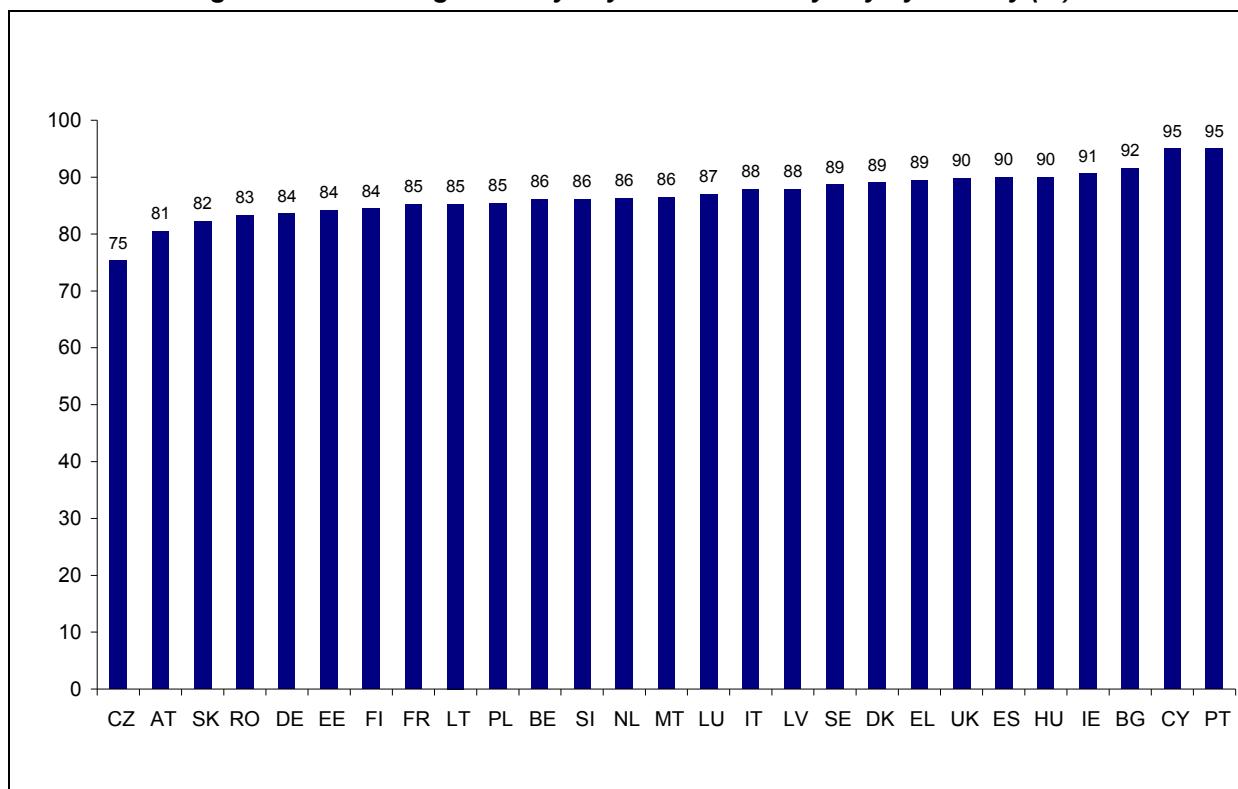
Additionally, constant coefficient of high penetration countries is more than two times greater than the ones of low and medium penetration rate. Obviously it doesn't mean that ICT is the reason of higher level of social leisure activity. It indicates only that people in high penetration countries are much more active in socially spent leisure time than citizens of low and medium penetration rate countries independently from the fact, whether they use the Internet or not.

2.4.5 Substitution between Internet use and television watching

We showed above that there is no negative association between Internet use and leisure time people spent on social activities. However, time spent on surfing the Internet must come from somewhere, as a day only consists of 24 hours. The literature suggests, based on early empirical research, that Internet use has a negative impact on time spent on non-social activities, such as watching television – for example Dutton et al. (2007). Research results from Finland also confirm this, as almost half of medium to high intensity Internet users reported a decrease in TV watching, but only 10% of them indicated decrease in time spent with friends (Nurmela et al., 2006). Additional studies found that time spent on Internet use is widely felt to have had a negative effect on time spent on watching television, but also on time spent reading newspapers, reading magazines and listening to the radio (see section 3.4).

Below we first investigate geographical differences and next the social-demographic composition of the group of people who spend above-average hours on watching television. Finally we explore the association between Internet and television usage.

Figure 15: Watching TV every day or almost every day by country (%)



Data source: Flash Eurobarometer 241

Watching TV daily is typical for most Europeans (87%), and there are not wide differences between countries (see Figure 15): Its lowest value is 75% (Czech Republic) and the highest is 95% (Portugal). There are no clear regional differences in this aspect in Europe. For example, a post-socialist country has the lowest value (Czech Republic), but two other ones can be found in the top five (Bulgaria, Hungary). All the South-European member states can be found in the upper half, however, together with two Nordic countries (Sweden and Denmark), and the British Isles.

As opposed to Internet use, Table 20 shows that TV watching is more frequent among older and lower educated people. Manual workers and non-working people also watch television somewhat more often. These differences are important for analysing the relationship between watching television and Internet use: We expect a negative association, but when we see it, we must know, whether those who use Internet watch less television because the two activities are substitutes, or because they belong to different social-demographic groups. Therefore, after analysing the two-way associations we construct a multivariate regression model.

It must be noted that the EB question is not a perfect measure to analyse the association between TV watching and Internet use, as watching television frequently is an activity which is extremely widespread. While we would expect that there are significant differences *within* the group of respondents who watch TV most frequently (daily or every day, which is 87% of the population), we lack the data to explore such differences.

Table 20: Frequency of watching television, by social-demographic variables

		TV watching daily or almost every day	N (100%)
Age	15-24	84.0%	4249
	25-39	84.0%	6464
	40-54	85.5%	7372
	55+	90.6%	8605
	Kendall's tau-b	0.071***	
Education finished at the age of	-15	90.7%	3996
	16-20	88.8%	11081
	20+	83.1%	8063
	Still in education	82.6%	3182
	Kendall's tau-b	-0.085***	
Subjective urbanization	metropolitan zone	85.5%	5934
	other town/urban/centre	88.1%	10720
	rural zone	85.5%	10300
	Kendall's tau-b	-0.009	
Occupation	Self-employed	80.9%	2446
	Employees	86.0%	9228
	Manual workers	86.4%	2009
	Not working	88.0%	13251
	Kendall's tau-b	0.049***	
Household type	Not single	87.3%	21607
	Single	84.4%	5129
Kendall's tau-b		-0.033***	
EU total		86.9%	27130

* $p<0.05$ ** $p<0.01$ *** $p<0.001$. Data source: Flash Eurobarometer 241

The two-way analysis (Table 21) shows that Internet use is actually related to decreased frequency of watching television. However, daily users do not watch television substantially less often than occasional users.

Table 21: Frequency of watching television, by Internet access / Internet use

		Internet use and access (%)			
		No access	Has access, but does not use	Uses Internet	Total
Watching TV	Weekly or rarer	9.2	9.3	15.0	13.1
	Daily or almost every day	89.6	89.5	85.1	86.9
	Kendall's tau-b				0.058***
EU total (N)		4911	3853	18338	27130

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

Taking into account the types of use (Table 22), there are no substantial further differences in TV watching between instrumental, resource enhancing, and recreational Internet users and those who use the Internet only for information seeking and e-mailing. (Although some of these minor differences are statistically significant in the large sample of the EB)

Table 22: Frequency of watching television, by type of Internet use

		Internet users ^a				
		Daily users	Resource enhancing users	Recreational users	Instrumental users	Total
Watching TV	Weekly or rarer	15.4	15.9	14.6	15.9	15.0
	Daily or almost every day	84.6	84.1	85.4	84.1	85.0
	Kendall's tau-b	-0.025***	-0.035***	0.007	-0.029***	
EU total		13962	10902	7849	9638	18338

^a = overlapping types. * p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

The multivariate regression (Table 23) can answer the question whether Internet use correlates with decreased TV watching, after controlling for social-demographic differences. We find that the answer is "no": When taking into account the social-demographic background, Internet users are not likely to watch television less (or more) frequently. Thus, the difference found above in frequency of TV watching between users and non-users was only due to the fact that the two groups are social-demographically different.

In the multivariate models it remains true that older people watch more TV and students less. Self-employed people also have less time to spend it with television. Multivariate model shows that internet use either occasionally or daily does not have an independent effect on TV watching. Those who use the Internet for recreation are more likely to watch television frequently than others. This was not found by the two-way analysis, because it was hidden by another effect: recreational users are typically younger, and these are people who usually watch less television. After we controlled this in the multivariate regression, it became visible that compared to other similar aged people recreational Internet users watch more TV.

Therefore, on the basis of this analysis, we do not find evidence that the additional time which Internet users devote to social leisure and civic activities comes from less time spent on non-social leisure activities, such as watching television – as was suggested by earlier studies. This may be due to the fact that the measure for TV watching used in the Eurobarometer survey was not optimal, as there are no data on how many hours respondents who watch television daily (87% of the population) actually devote to this activity.

Table 23: Regression model on association between watching television and Internet access/use

Independent variables:		Dependent variable: watching TV every day or almost every day
Internet	Access but no use	1.05
	Occasional use	0.98
	Frequent use	1.01
Type of Internet use (reference: tentative users)	Instrumental use	0.91
	Resource enhancing use	1.23***
	Recreational use	0.94
Age (reference: 25-39)	15-24	1.03
	40-55	1.03
	Over 55	1.71***
Education finished at age (reference: 15-20)	Less than 15	0.99
	More than 20	0.63***
	Student (not finished)	0.53***
Occupation (reference: employee)	Self employed	0.64***
	Manual worker	0.85*
	Not working	0.99
Residence (reference: other urban)	Metropolitan	0.88***
	Rural	0.73***
Household type	Single	0.64***

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

2.4.6 Conclusions

Whereas a few earlier studies presented evidence for a negative effect of Internet use on time spent socially, most research did not find any effect, neither a negative nor a positive one. We have analysed four activities: sport, meeting friends, going to restaurants and going to cinema, theatre or performances.

We have found that these activities are highly determined socially: a higher social status and younger age have a strong positive effect on the likelihood that a person engages in these activities.

We have gone beyond previous analyses by producing evidence which suggests that Internet access and use are related to a higher frequency of social activities even after the social-demographic differences have been taken into account.

However, as mentioned in the previous section, caution must be exercised in interpreting these findings, as we cannot be sure, having analysed cross-sectional data only, about the direction of causality: whether Internet use enhances off-line sociability or socially more involved people choose to use the Internet.

Given this situation, we can use questions about people's opinions and perceptions as the missing link. As presented in the next section, 63% of the EU27 population agrees that people without Internet have more time for themselves, their family and friends. Even among Internet users, more than half of them agree with this statement. This indicates a negative effect of Internet regarding (traditional) social leisure activities and suggests that what we have found by means of multi-variate analysis may be the second effect: people who are more engaged in social leisure activities in the first place are more likely to make extensive use of the Internet, as the online sphere provides them with additional possibilities to interact with other people.

In contrast, the EB data also shows that 70% of Internet users perceive that the Internet has helped them to access and share views about cultural issues, and a majority of them state that the Internet has improved their relationship with family and friends. Although this

improvement may consist of online contact only (to people or to cultural content), it appears reasonable to conclude that this increased online activity may be associated with more interest offline, as well. Having access to online information about public entertainment, social events, restaurants and pubs etc. is likely to facilitate people to experience these offers in the real world.

Furthermore, we also tested whether different patterns of Internet use have an additional effect on sociability. We found that using the Internet for recreation (sharing photos, gaming, downloading media or games) has a substantial positive effect. Additionally, resource enhancing (work, social networking, reading news and learning on the Internet) has a moderate positive effect, too. On the other hand, instrumental Internet use does have neither a positive nor a negative effect.

The analysis does not support the view that the positive relationship to be observed between Internet use and social leisure activities is due to the fact that Internet users can perform their tasks (such as shopping or contacting the administration) more efficiently, and thereby free up time they can then use for socialising.

We assume that the positive relationship between recreational use of the Internet and social recreation offline can be attributed to other effects. Unobserved external effects might prevail; for instance, persons who have a high interest in recreation (independently from their social background) may be expected to pursue both online and offline recreation more often. Additionally, it is visible that online recreational activities supplement the offline version: For example, friends who are used to meet face-to face can now also upload and share their photos on the Internet; many people who download movies or games from the Internet enjoy watching or playing with such online content jointly with others.

2.5 Perceptions about ICT's social effects

In this chapter we shall investigate how people think about the Internet. First Internet users' perceptions are presented concerning the experiences users have made with regard to the Internet's impact on different domains of their life. Second, a list of statements was presented to all respondents (Internet users as well as non-users) about the perceived implications of not using the Internet. Next, perceptions are compared between frequent users, occasional users and non-users of the Internet. Finally data about the same issues are broken down according to country group (low, medium and high level of Internet penetration).

2.5.1 Perceived effect of the Internet on different domains of life

It is visible from the breakdowns in Table 24 that the vast majority of users feel that the Internet has improved their resource enhancing capabilities (learning, working, getting informed and access to culture). Two thirds say that the Internet has improved their ability to obtain health-related information. More than one in two users feels that the Internet has improved their relationship with friends and family members, while less than half say the Internet has added opportunities to meet new people.

Table 24: Internet users' opinions (Proportion of those who agree with different statements concerning the positive effects of Internet)

"Internet has improved"...	Agree (3-4 on a 4-point scale, %)	Average	Standard deviation
A. Your opportunity to meet new people	43.5	2.32	1.11
B. The way you manage your finances	50.7	2.45	1.16
C. The way you deal with public authorities	47.8	2.38	1.15
D. The way you get health-related information	67.1	2.81	1.03
E. The way you perform your job	65.8	2.77	1.02
F. The way you shop	49.6	2.43	1.09
G. Your opportunity to learn	74.4	3.00	0.99
H. The way you pursue your hobbies	50.6	2.46	1.09
I. Your capability to be informed about current issues	86.7	3.32	0.85
J. Your relationships with family members and friends	57.0	2.62	1.09
K. Your opportunity to share views/access culture	70.4	2.88	0.98

Data source: Flash Eurobarometer 241

Less than half of users feel that the Internet has had positive implications regarding instrumental uses such as shopping and contacting the public authorities. One may suppose that these service-based activities largely depend on the spread of the applied systems and on the rate of Internet penetration. The data support this assumption: if we investigate the perceptions according to the country's rate of Internet penetration it turns out that the percentage reporting positive experiences is significantly higher in the countries with high penetration rates.

The share of people who actually carried out these Internet activities (Table 25) is close to the proportion of those who experienced improvement in their life domains. The greatest difference is between those who experienced improvement in learning and those who have participated in online courses, the percentage for the latter being significantly smaller. This suggests that the Internet's positive effect on learning is not only due to new techniques (such as online learning), but also due to use of the Internet for traditional educational purposes.

Table 25: Prevalence of using selected activities using the Internet

Activity	% of Internet users (ever used)
Buying or selling things	60.3
Internet Banking	51.1
Electronic administration (filling or sending forms)	44.5
Learning or doing online course	35.1
Using Internet for work	55.7

Data source: Flash Eurobarometer 241

Factor analysis of *Internet users' perceptions* about to what extent they benefited from the Internet in different spheres of life revealed *three* characteristic underlying *factors*. The first factor had to do with *cultural and material resources*: it emphasized that the Internet has improved opportunities for learning, individual job performance, the capability to obtain health related and general information, and the opportunity to access and share views about culture. The second factor puts together the positive perceptions concerning *instrumental usage*: these include the Internet's contribution to better ways of shopping, to managing finances and to contacting public authorities. The third factor combines *recreation and social contacts*: one's relationship with friends, family members and new people as well as the way one pursues a hobby. What we can see from this is that the opinion structure of Internet users

overlaps largely but not perfectly with the theoretical considerations on Internet users' types (see chapter 2.2.3). The type of instrumental usage is a clear case. The factor of cultural and material resources is very close to the resource enhancing type as well. In the third factor however social resources are closer to recreation than to cultural resources and work. This is an important lesson shedding light on the hidden and mixed character of social resources: it reveals that in everyday practice keeping contacts frequently coincides with passing time and it is not always realized that it may enforce capabilities as well.

Table 26: Correlations between types and opinions of Internet users

Types of Internet usage	Opinions (the Internet improved...)		
	Cultural and material resources	Instrumental activities	Recreation and contacts
Instrumental	.05**	.40***	n.s.
Resource enhancing	.25***	.16***	.15***
Recreational	.15***	.11***	.27***

*** $p < 0.001$. Data source: Flash Eurobarometer 241

The correlation analysis of the ways one uses the Internet and the opinions about the Internet's positive effects on different domains shows that actual use and opinions are positively connected, as it is expectable. Instrumental users tend to be more positive about Internet's positive effect on instrumental uses. Resource enhancing use has the highest correlation with positive opinions on that Internet improved their opportunity to learn, the way they pursue their job, and also their information on health and culture. Recreational use had the highest correlation with positive opinion on recreation (hobby) and social contacts. Resource enhancing and recreational modes of use however are positively correlated with other (not usage type-specific) opinions as well.

2.5.2 Perceived implications of not using the Internet

The vast majority of people think that non-users of the Internet are less reachable for professional purposes and are at disadvantage during their career (Table 27). More than two-thirds think that they also may miss good online shopping opportunities.

But the majority also feels that those who do not use the Internet take less risk of being affected by online fraud and by frustration caused by the complexity of ICT. The majority of people disagree with the statement that non-users are less informed or less open than Internet users. Moreover, more than half of all respondents feel that not using the Internet means more time for family and friends. This latter result is partly in line with findings of other studies. For example, World Internet Project results indicated, that more Internet users felt decrease, than increase in time spent with household members. However, WIP respondents also experienced increase, rather than decrease in contact with friends. Furthermore, majority of respondents of the LIFE Digitales Leben study agreed with the statement, that "without the Internet and telecommunications it would be impossible for me to maintain my contacts to friends and my family", which highlights that the way one ask a question may significantly effect the results (see Section 3.2.2).

Opinions concerning the implications of not using the Internet are significantly connected to frequency of use (Table 28).

Most people, except for frequent users, disagree with the statement that non-users miss opportunities for socializing with friends and family. Regular Internet users are more convinced that people without Internet miss career opportunities, that they are less available for professional purposes and that they miss good bargains. The majority disagree with the statement that Internet non-users are less open and less informed, but frequent users tend to disagree less than non-users. On the other hand, a significantly higher share of non-users

reported that they avoid frustration caused by complicated technologies, take less risk and have more time for friends, family and for themselves.

Table 27: Perceived implications of not using the Internet

"People that don't use the Internet" ...	Agree (3-4 on a 1-4 scale) in %	Average	Standard deviation
A. Miss the opportunity of greater contact with friends and family	44.5	2.36	1.07
B. Are at a disadvantage in their career prospects	60.6	2.7	1.04
C. Risk becoming old-fashioned	50.5	2.46	1.07
D. Miss the opportunity of finding good bargains online (including airline tickets and trips)	71.4	2.93	1.00
E. Are less open to the outside world	41.9	2.31	1.06
F. Know less and are not as well informed as other people	44.1	2.36	1.07
G. Have more time for themselves, family and friends	63.4	2.8	1.03
H. Take less risk because they don't get exposed to the risk of online fraud	69.4	2.91	0.98
I. Take less risk because they don't run the risk of other people finding out information about them	62.6	2.76	1.02
J. Are less reachable for professional purposes	65.7	2.8	1.01
K. Avoid the frustration of dealing with complicated technologies	55.0	2.57	1.02

Data source: Flash Eurobarometer 241

Table 28: Perceived implications of not using the Internet, by the frequency of Internet use (percentage of those who agree)

"People that don't use the Internet" ...	Frequency of Internet use				N	Kendall's tau-b
	No access	No or less than once a month	Once a day or once a week	Several times a day		
A. Miss the opportunity of greater contact with friends and family	42.1	35.1	43.7	53.5	11237	0.089***
B. Are at a disadvantage in their career prospects	57.1	56.2	60.7	64.5	14673	0.056***
C. Risk becoming old-fashioned	42.7	41.5	53.4	56.1	12671	0.102***
D. Miss the opportunity of finding good bargains online (including airline tickets and trips)	59.1	58.9	74.8	80.1	17603	0.17***
E. Are less open to the outside world	39.6	36.6	42.7	44.8	10484	0.048***
F. Know less and are not as well informed as other people	41.7	42.0	43.7	47.0	11196	0.038***
G. Have more time for themselves, family and friends	73.6	74.3	59.2	54.8	15778	-0.13***
H. Take less risk because they don't get exposed to the risk of online fraud	77.2	76.0	68.9	62.9	17025	-0.109***
I. Take less risk because they don't run the risk of other people finding out information about them	69.6	68.1	62.0	57.0	15253	-0.091***
J. Are less reachable for professional purposes	63.2	59.0	65.7	70.1	15920	0.067***
K. Avoid the frustration of dealing with complicated technologies	57.1	55.3	55.6	53.2	13210	-0.023***

* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

In spite of these significant differences, however, in general both users and non-users showed strong similarity in assessing the statement, except for one statement where

opinions between Internet users and non-users completely diverge: While the majority of Internet users think that non-users take the risk of becoming old fashioned, most non-users do not share this view.

Connections of opinions about the lack of Internet use are weaker with the rate of penetration than with frequency of use (Table 29). There is no significant difference in the evaluation of career prospects between countries with low and high Internet penetration. In countries with high penetration rates significantly more people feel that non-users are at a disadvantage because they cannot access online bargains.

The results suggest that perceptions about instrumental and resource enhancing types of Internet use are more positive in countries with a high penetration rate. As it was demonstrated, the majority disagree with the statement that Internet non-users are less open and less informed. Disagreement was slightly but significantly less widespread in the low penetration country group, where more than one in two respondents agree that non-users are at risk of becoming less knowledgeable. The statement that lack of Internet use might lead people to become old fashioned is more widely present in high penetration countries.

There is one more aspect to be mentioned here. In high penetration countries the view is more widespread that non-users take less risk of being affected by online fraud and technological frustration. This is interesting because these statements are negatively associated with frequency of use, that is frequent users tend to agree less with these statements than other respondents. The reason might be that in the countries where Internet use is widespread the general population has become more sensitive towards security risks and technological shortcomings because of the central role ICTs play in nearly all spheres of life.

Table 29: Perceived implications of not using the Internet, by the rate of Internet penetration (percentage of those who agree)

“People that don’t use the Internet” ...	Proportion of Internet users			N	Kendall’s tau-b
	Low (-59 %)	Medium (60-74 %)	High (75- %)		
A. Miss the opportunity of greater contact with friends and family.	47.4	41.5	49.3	11244	ns
B. Are at a disadvantage in their career prospects	62.8	58.9	62.9	14684	ns
C. Risk becoming old-fashioned	46.8	49.6	56.8	12683	0.062***
D. Miss the opportunity of finding good bargains online (including airline tickets and trips)	69.6	69.4	78.8	17609	0.063***
E. Are less open to the outside world	48.5	37.5	46.3	10494	-0.019**
F. Know less and are not as well informed as other people	51.7	41.4	43.2	11202	-0.057***
G. Have more time for themselves, family and friends	60.4	64.6	63.2	15791	0.019**
H. Take less risk because they don’t get exposed to the risk of online fraud	67.5	68.2	74.6	17038	0.048***
I. Take less risk because they don’t run the risk of other people finding out information about them	58.4	61.9	78.6	15265	0.066***
J. Are less reachable for professional purposes	66.5	65.2	65.9	15929	ns
K. Avoid the frustration of dealing with complicated technologies	52.1	52.1	65.9	13219	0.085***

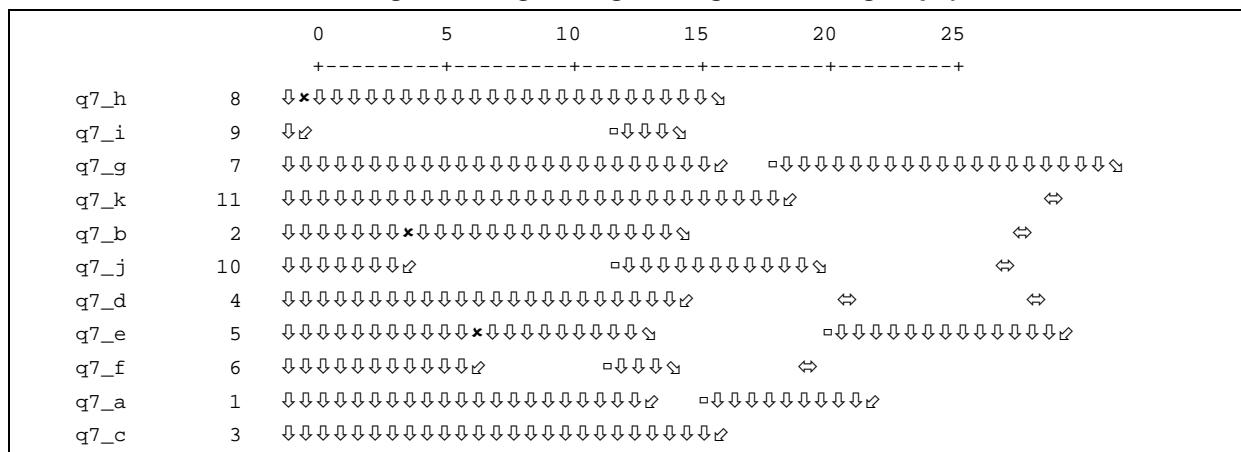
* p<0.05 ** p<0.01 *** p<0.001. Data source: Flash Eurobarometer 241

2.5.3 Multivariate analysis

Cluster analysis demonstrates that perceptions about the implications of not using the Internet fall in two major groups (Figure 16). The first group believes that people who do not use the Internet avoid *problems*, risk and frustration. The second group, on the contrary, emphasizes that non-use of the Internet implies *missing opportunities*. Within this second opinion there is a sub cluster of items centred on the issue of missing *market opportunities* (career and business) and another one which has to do with missing *contacts* with friends, other people and the outside world.

Factor analysis resulted in two major factors (Table 30): the first factor is about *missing opportunities*, and the second factor is about the *lower risk* those persons face who don't use the Internet. We carried out a regression analysis in order to clarify the social and cultural background of these opinions.

Figure 16: Perceived implications of not using the Internet (Hierarchical cluster analysis dendrogram using average linkage between groups)



Where the question is: "To what extent do you agree or disagree that people that don't use the Internet...". The options are:

- q7_a= Miss the opportunity of greater contact with friends and family*
 - q7_b= Are at a disadvantage in their career prospects*
 - q7_c= Risk becoming old-fashioned*
 - q7_d= Miss the opportunity of finding good bargains online (including airline tickets and trips)*
 - q7_e= Are less open to the outside world*
 - q7_f= Know less and are not as well informed as other people*
 - q7_g= Have more time for themselves, family and friends*
 - q7_h= Take less risk because they don't get exposed to the risk of online fraud*
 - q7_i= Take less risk because they don't run the risk of other people finding out information about them*
 - q7_j= Are less reachable for professional purposes*
 - q7_k= Avoid the frustration of dealing with complicated technologies.*

Data source: Flash Eurobarometer 241

Table 30: Perceived implications of not using the Internet: Results of factor and cluster analyses

Missing opportunities		Avoiding problems
Market opportunities	Social opportunities	More time for family and friends
Disadvantage in career	Less contact with friends and family	
Less reachable for professional purposes	Less open to outside world	Less risk of online fraud
Miss the opportunities of online bargains	Less informed Become old fashioned	Less risk of discovering their personal information

Data source: Flash Eurobarometer 241

The regression analysis (Table 31) showed that the first factor of opinions, which emphasized missing market and society-related opportunities for non-users of the Internet, is influenced most strongly by the very fact of Internet use, as well as by type of use. Especially resource enhancing and recreational Internet use is associated with the perception that non-users miss opportunities.

Table 31: Regression model on perceived implications of not using the Internet (Dependent Variable: "missing opportunities" factor scores)

Independent variables:		Dependent variable
Internet	Access but no use	-.158***
	Occasional use	.260***
	Frequent use	.082***
Type of Internet use (reference: tentative users)	Instrumental	.066***
	Resource enhancing use	.216***
	Recreational use	.252***
Age (reference: 25-39)	15-24	-.058
	40-55	-.018
	Over 55	.119***
Education finished at age (reference: 15-20)	Less than 15	-.018
	More than 20	-.068***
	Student (not finished)	-.107**
Occupation (reference: employee)	Self employed	.051*
	Manual worker	.166***
	Not working	.073***
Residence (reference: other urban)	Metropolitan	-.006
	Rural	-.058**
Household type	Single	-.046*

* p<0.05 ** p<0.01 *** p<0.001. Enter method, adjusted R-square: .067. Data source: Flash Eurobarometer 241

Table 32: Regression model on perceived implications of not using the Internet (Dependent Variable: "risk avoidance" factor scores)

Independent variables:		Dependent variable
Internet	Access but no use	.048
	Occasional use	-.058
	Frequent use	-.209***
Type of Internet use (reference: tentative)	Instrumental	-.077***
	Resource enhancing use	-.061**

users)	Recreational use	.035
Age (reference: 25-39)	15-24	.010
	40-55	.028
	Over 55	.102***
	Less than 15	.138***
Education finished at age (reference: 15-20)	More than 20	-.087***
	Student (not finished)	-.091**
	Less than 15	.138***
Occupation (reference: employee)	Self employed	-.094***
	Manual worker	.083**
	Not working	-.027
Residence (reference: other urban)	Metropolitan	-.004
	Rural	.044**
Household type	Single	-.008

p<0.05 ** p<0.01 *** p<0.001. Enter method, adjusted R-square: .045. Data source: Flash Eurobarometer 241

Interestingly, other things being equal elderly people are more likely to feel that non-users miss opportunities than young people; and persons who do not have Internet access (maybe because they cannot afford it) are more aware of such disadvantages than people who have access but are not using the Internet. The latter may be explained by the likely impact of material or technical constraints: While lack of access is often due to external circumstances, non-use by persons who have access may be the result of a conscious decision not to use the Internet.

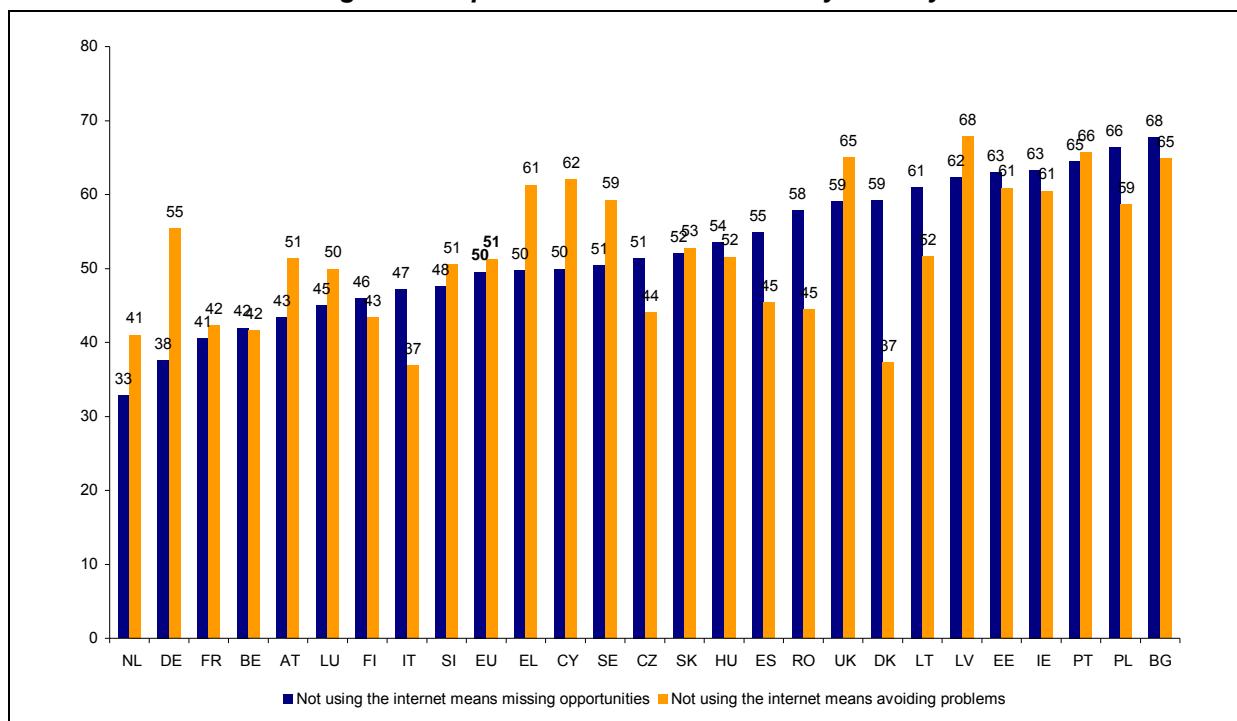
Respondents with either low or high educational attainment are less aware of disadvantages arising from non-use of the Internet compared to those who have secondary education. What we can see from this is that perceptions concerning the impacts of ICT on daily life are not linearly dependent on social-demographic and cultural factors.

Table 32 presents the results from regression analysis on the determinants of opinions which put the emphasis on non-users avoiding Internet-related risks and technology-induced frustration. Frequent Internet users, instrumental and resource enhancing Internet users as well as highly educated people tend to disagree with this opinion. On the other hand, elderly people, those with lower educational attainment, and Internet non-users tend to share the opinion that not using the Internet means avoiding risks and problems.

As the two opinions are the result of a factor analysis, they are not correlated on the individual level. On the country level a substantial correlation can be found ($r=0.53$). The connection is positive, which means that in countries where people tend to be more concerned about the opportunities, they are more conscious about possible problems, too.

There are no clear regional differences in the missing opportunities view (Figure 17). Many East-European member states have high percentages of the population sharing this view, but the same applies to the citizens of Portugal, Ireland and Malta.

Regarding the “avoiding problems” view, no regional differences can be observed at all. Countries with below-average percentages of people agreeing with this view are Italy and Denmark, while states where the majority of adults consider the Internet a source of potential problems include Latvia, Portugal, the United Kingdom and Italy.

Figure 17: Opinions about the Internet by country

Data source: Flash Eurobarometer 241

2.5.4 Conclusions

The majority of Internet users have a positive perception about the impacts of Internet use on everyday life. According to their opinions, the Internet has already contributed to improvement of their lives especially in the following domains: learning, work, culture, health related and general information.

Factor analysis has shown that perceptions of the Internet's positive effects on different domains can be clustered into three factors. The first is improvement regarding cultural and material resources: it represents the categories mentioned above, i.e. those where respondents felt the strongest improvements. The second factor combines positive opinions about instrumental usage modes: how the Internet contributed to the ease of shopping, managing finances and contacting public authorities. The third factor is that of recreation and social contacts. In everyday life keeping contacts and passing time frequently coincides, which may hide the fact that it has different social impacts. Correlations between types of use and perception factors showed that respondents are most likely to feel a positive impact of the Internet in those domains for which they actually use the Internet.

Considering the opinions about the implications of not using the Internet, regular Internet users are more convinced than other respondents that non-users of the Internet miss career opportunities, that they are less reachable for professional purposes, and that they miss good bargains. Non-users themselves, on the other hand, are more likely to report that they feel less threatened by Internet-related risks such as online fraud and unintentional disclosure of personal data.

In general we can observe a trend of users to be more convinced about the positive impacts of the Internet, and non-users putting more emphasis on the potential negative effects. This is a pattern which is often found in questionnaire research of this type, as non-users tend to justify their behaviour by claiming that there would be no reason for them to use the item in question.

The survey data also show that the view that non-users take less technical risk is more prevalent in high penetration countries. This means that, while – at individual level – a high frequency of Internet use makes it *less* likely that a person perceives security risks, at country level high penetration rates of Internet use are associated with more widespread security concerns.

By means of cluster and factor analyses we separated two types of perceptions concerning the implications of *not* using the Internet: one suggests that non-users are missing opportunities and the other that they avoid risks. The cluster analysis also showed that the missing opportunities factor can be further separated into missing market opportunities (related to work and shopping) and the missing social opportunities (missing social contacts, becoming less informed and old fashioned).

Our multivariate regressions showed that Internet use, and especially resource enhancing and recreational Internet use, are positively associated with the missing opinions view. This indicates that individuals who use the Internet in these ways are most likely to experience positive impacts of using the Internet. The fact that resource enhancing Internet users are most likely to report positive effects of using the Internet can be easily understood, as Internet users in general reported that the most positive impact was related to enhancing resources (work, health, learning, information and culture), as we have seen before. A smaller share of respondents experienced improvements in the recreational area (such as pursuing hobbies), but those who do use the Internet for recreation are also very likely to report positive impacts in this area.

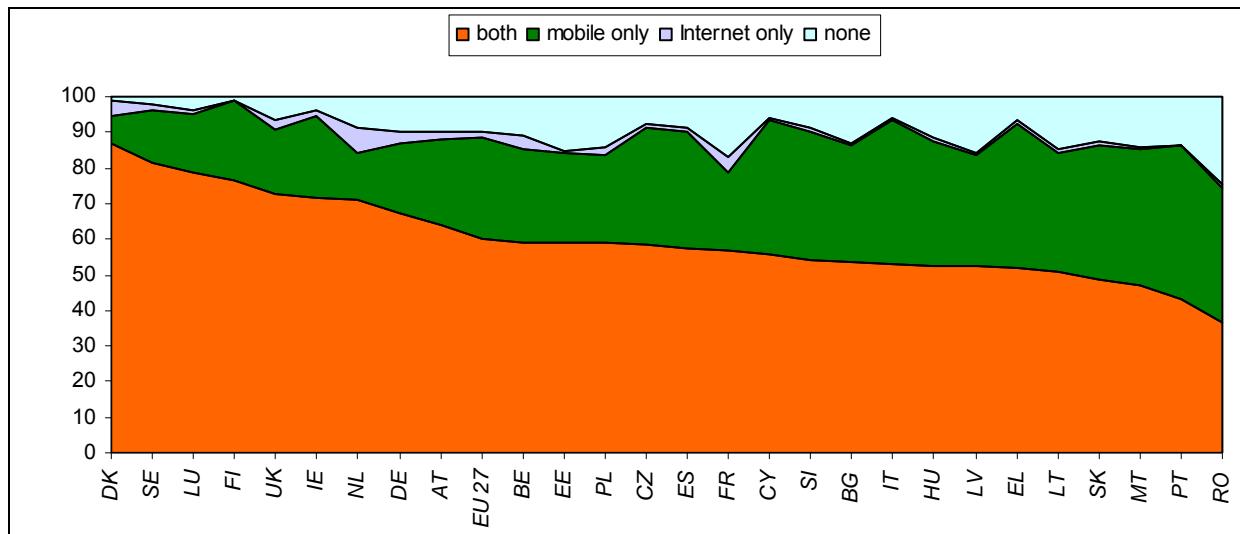
Individuals who do not use the Internet in spite of having access to the Internet at home are less convinced that they miss opportunities compared to non-users without access, which is understandable as we can assume that they *chose* not to use the Internet.

Our analysis also showed that **older Europeans are more likely to agree compared to younger ones that non-users of the Internet are missing opportunities** (after controlling for Internet use and other social-demographic variables). This is a significant finding as it suggests that – contrary to the popular assumption that older non-users lack an understanding of what the Internet could be good for – older people are very well aware that people derive significant benefits from using the Internet. Since a large share of them are still non-users of the Internet, this brings up the question how more older people can be enabled to fully share in the benefits from being online.

Finally, regular Internet users tend to agree less with the statement that not using the Internet is a way to avoid risks such as fraud and infringement of data privacy. Concerning the effect of social-demographic background variables, older and lower educated respondents turned out to be more likely to share this negative opinion, while there is little difference between types of Internet users.

2.6 Mobile phone

The spread of mobile phone in Europe is close to saturation level. Penetration rates are roughly two times higher for use of the mobile phone than for use of the Internet: The proportion of those who do not have a mobile phone is 11%, while the figure for those who do not have Internet access is 23%. Or looking at from an other perspective, every second respondent reported they use the mobile phone several times a day, while only one out of four uses the Internet that frequently.

Figure 18: Internet and mobile usage in the EU-countries

Data source: Flash Eurobarometer 241

As Figure 18 shows, three out of five Europeans use both Internet and a mobile phone. The overwhelming majority of those who use the Internet use a mobile phone as well, and more than a quarter of respondents use mobile only. The two extremes are Denmark, on the one hand, where almost nine out of ten individuals use both communication tools, and Romania, on the other hand, where less than two out of five avail of both technologies, and a quarter uses none of them.

The ten items of the questionnaire¹² concerning the opinions about mobile phone can be pooled into three underlying opinions:

- Mobile telephony enables **better management of leisure time, work and security**.
- Mobile telephony leads to **better or more contacts** with family members, friends and the outside world.
- Mobile telephony results in **more stress and higher costs**.

Multivariate regression analysis of the connections between background variables and opinion factors shows that frequent mobile use is associated most strongly with these opinions (see Table 33 to Table 35): Frequent mobile users are much more likely to agree to the two positive views.

Recreational Internet users tend to have a positive opinion about how mobile phone can help time management, whereas instrumental Internet users are less likely to share this view. Rural and elderly people tend to be more sceptical about possible positive impacts of the mobile phone, as are the highly educated. Young people, the low educated and non-working individuals, on the other hand, do consider the mobile phone as a useful tool for managing schedules and for enhancing security.

¹² Original items were the following: To what extent do you agree with the following statements? Using mobile phone has helped you(1.) to keep in contact with family and friends? (2.) to be more informed? (3.) to better manage your free time/leisure time? (4.) to share ideas and material like photos etc. with other people? (5.) to feel more secure? (6.) in your work?

To what extent do you agree that people who do not use a mobile phone... (1.) miss the opportunity of having more contact with family and friends? (2.) are less reachable by the outside world? (3.) are saving money in purchasing such devices and on their telephone bills? (4.) have less stress in their lives?

**Table 33: Linear regression model on the opinions concerning the impact of mobile phone
(Dependent Variable: “better time management” factor scores)**

Independent variables:		
Type of Internet use (reference: tentative users)	Instrumental use	-.104***
	Resource enhancing use	.017
	Recreational use	.169***
Age (reference: 25-39)	15-24	.123***
	40-55	-.117***
	Over 55	-.053*
Education finished at age (reference: 15-20)	Less than 15	.113***
	More than 20	-.147***
	Student (not finished)	-.168***
Occupation (reference: employee)	Self employed	.008
	Manual worker	.021
	Not working	.072***
Residence (reference: other urban)	Metropolitan	-.007
	Rural	-.063***
Household type	Single	-.011
Mobile usage	Several times a day	.458***

* p<0.05 ** p<0.01 *** p<0.001. Enter method, adjusted R-square: .085. Data source: Flash Eurobarometer 241

Frequent users of the mobile phone as well as recreational Internet users tend to share the opinion that the mobile phone helps to establish more contacts with the outside world as well as with friends and family members. Other things being equal, people with low educational attainment, persons outside the labour force and manual workers are also more likely to agree with this statement. In contrast, single people, rural and metropolitan dwellers (as opposed to people living in small towns), and the self-employed are significantly less likely to believe that mobile phone users benefit from more contacts with the outside world and with friends and family members.

**Table 34: Linear regression model on the opinions concerning the impact of mobile phone
(Dependent Variable: “more contacts with family, friends & outside world” factor scores)**

Independent variables:		
Type of Internet use (reference: tentative users)	Instrumental use	-.041**
	Resource enhancing use	.009
	Recreational use	.103***
Age (reference: 25-39)	15-24	.031
	40-55	-.063***
	Over 55	-.009
Education finished at age (reference: 15-20)	Less than 15	.120***
	More than 20	-.012
	Student (not finished)	-.061*
Occupation (reference: employee)	Self employed	-.074**
	Manual worker	.065*
	Not working	.058**
Residence (reference: other urban)	Metropolitan	-.074***
	Rural	-.081***
Household type	Single	-.064***
Mobile usage	Several times a day	.329***

* p<0.05 ** p<0.01 *** p<0.001. Enter method, adjusted R-square: .038. Data source: Flash Eurobarometer 241

Negative perceptions about the impacts of the mobile phone, in particular the opinion that it may increase stress and incur high costs, are more likely among older individuals and in rural

regions, among people outside of the labour market and those with low educational attainment. Surprisingly, respondents from metropolitan regions and those with tertiary education are also more likely to share these views. In contrast, frequent mobile users and instrumental Internet users tend to disagree with these negative statements about the effects of mobile telephony.

**Table 35: Linear regression model on the opinions concerning the impacts of mobile phone
(Dependent Variable: "more stress and costs" factor scores)**

Independent variables:		
Type of Internet use (reference: tentative users)	Instrumental use	-.057***
	Resource enhancing use	-.010
	Recreational use	-.028
Age (reference: 25-39)	15-24	-.116***
	40-55	.023
	Over 55	.109***
Education finished at age (reference: 15-20)	Less than 15	.081***
	More than 20	.048**
	Student (not finished)	-.026
Occupation (reference: employee)	Self employed	.087***
	Manual worker	.025
	Not working	.058**
Residence (reference: other urban)	Metropolitan	.051**
	Rural	.058***
Household type	Single	.019
Mobile usage	Several times a day	-.083***

p<0.05 ** p<0.01 *** p<0.001. Enter method, adjusted R-square: .02. Data source: Flash Eurobarometer 241

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3 Related Findings from Other International Surveys

3.1 Introduction

This section is devoted to statistical data from other sources than the EB 318 concerning the social impacts of ICTs. Statistics from non-European sources which do not cover at least one EU Member State as well will not be reported in the present document. This means that findings from the US-based Pew Internet Project, which has been very active in collecting statistics on the social impact of Internet use, will only be discussed below if this is necessary for understanding available statistics for Europe¹³.

Measures of social uses of ICT are increasingly appearing in household surveys, including those based on the OECD's model surveys of ICT use. Unfortunately, little comparative analysis has been carried out using these data, as the recent overview document produced by the OECD (2008a) shows. The paper summarises the existing statistical evidence on the topic as follows: "Such surveys are revealing that ICT is changing how people do things such as:

- How and where they work.
- What kinds of things they study and what jobs they do.
- How they do everyday activities such as shopping, banking and dealing with government.
- How they spend their income.
- How they spend their time.
- How they obtain information on a variety of subjects including current affairs and health; and
- How they communicate with family and community."

The document fails, however, to substantiate these statements, and to discuss what such changes mean with regard to the people affected: What difference does it make for the persons involved whether they carry out the bulk of their shopping offline or online? Care has to be taken before jumping to the conclusion that the Internet has made life better for people, since other determinants of changes in social variables need to be considered as well. For example, changes in the way people work are arguably as much influenced by long-term changes in global production structures and in national regulatory environments as they are by the implementation of ICT at the workplace.

3.2 Online social networking and sociability

3.2.1 Use of online social networking services

Data on the use of applications of what is being termed the "participative web" has become available from a number of sources in the last one to two years. The value of available statistics is limited, by a lack of common definitions and methodologies for data collection (cf. OECD, 2008a).

In Germany, the annual "online study" conducted by the two main national public broadcasting stations (ARD and ZDF) has featured questions related to the issue since 2006. Results indicate, as is the case in other countries, that interest in, take-up of and perceived

¹³ Other Pew Internet findings will be featured in the Horizontal Domain Report to be submitted later in 2009.

relevance of online social networking has grown significantly. Between 2007 and 2008, the share of Internet users who use private social networking platforms (such as MySpace) "at least occasionally" increased from 15% to 25% (Table 36).

Table 36: Use of Web 2.0 applications in Germany, 2007-2008 (in % of all Internet users aged 14+)

	gelegentlich (zumindest selten)		regelmässig (zumindest wöchentlich)	
	2007	2008	2007	2008
Videoportale (z. B. You Tube)	34	51	14	21
Wikipedia	47	60	20	25
Fotosammlungen, Communitys	15	23	2	4
Lesezeichensammlungen	3	3	0	1
berufliche Netzwerke u. Communitys	10	6	4	2
private Netzwerke u. Communitys	15	25	6	18
Weblog	11	6	3	2
virtuelle Spielwelten	3	5	2	2

Basis: Onlinenutzer ab 14 Jahren in Deutschland (2007: n=1142, 2008: n=1186).

Source: Fisch & Gscheidle (2008: 358), based on data from the ARD/ZDF Online Studie 2008

While there is little difference between male and female Internet users in this respect, differences between age groups are, as to be expected, huge (see Table 37): Two in three German Internet users in the age group 14-19 years use private social networking platforms, and more than one in two in the age group 20-29 years. By comparison, only 1% of German Internet users aged 50 to 59 avail of these applications.

Table 37: Use of Web 2.0 applications in Germany by gender and age group, 2008 (in %)

	zumindest selten genutzt, in %								
	Gesamt	Frauen	Männer	14-19 J.	20-29 J.	30-39 J.	40-49 J.	50-59 J.	ab 60 J.
Videoportale (z. B. YouTube)	51	42	58	90	77	59	43	18	9
Wikipedia	60	58	61	91	76	54	59	45	31
Fotosammlungen, Communitys	23	25	22	38	33	20	17	15	18
Lesezeichensammlungen	3	2	4	5	3	5	3	3	1
berufliche Netzwerke u. Communitys	6	5	8	8	10	9	6	2	1
private Netzwerke u. Communitys	25	24	25	68	57	20	7	1	1
Weblogs	6	4	7	9	9	8	4	1	1
virtuelle Spielwelten	5	2	7	11	10	3	3	2	1

Basis Onlinenutzer ab 14 Jahren in Deutschland 2008: n=1186.

Source: Fisch & Gscheidle (2008: 359), based on data from the ARD/ZDF Online Studie 2008

As Table 38 shows, however, there is also a large percentage of Internet users who are not interested in make self-penned text contributions available online. Again, there is a large effect of age on the propensity of Internet users to contribute self-produced material to online platforms.

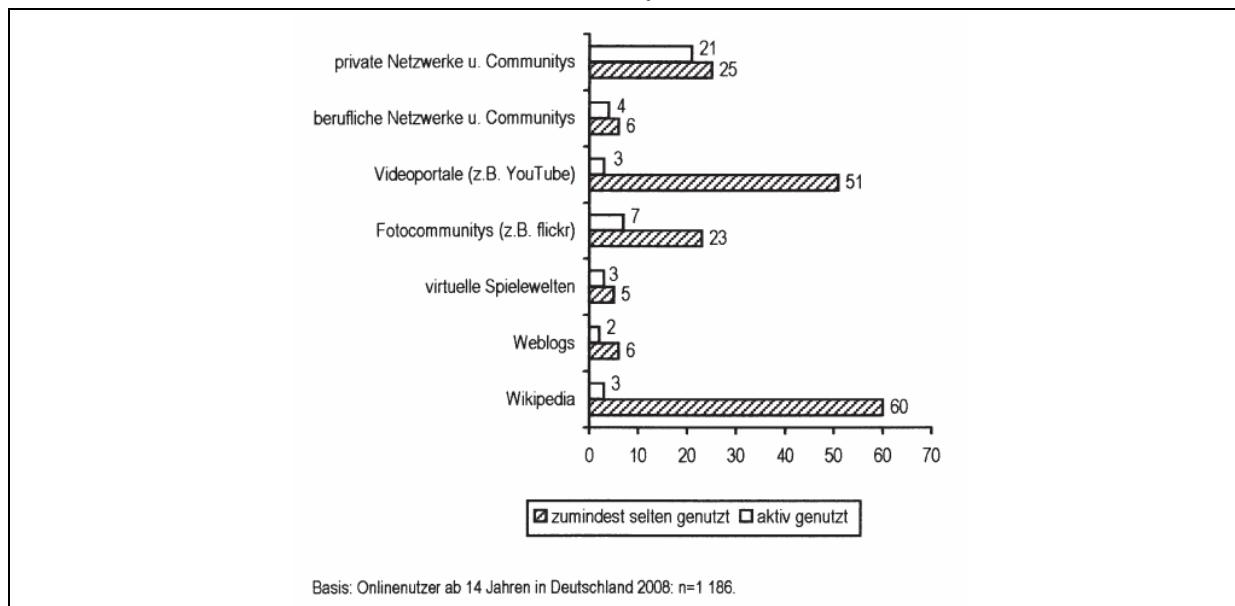
Table 38: Interest in the possibility to contribute self-produced texts to online platforms (in % of all Internet users aged 14+)

	2006 Gesamt	2007 Gesamt	2008 Gesamt	Frauen	Männer	14-19 J.	20-29 J.	30-39 J.	40-49 J.	50-59 J.	ab 60 J.
sehr interessiert	10	13	13	11	15	27	14	16	10	6	7
etwas interessiert	15	18	22	22	21	30	31	20	16	16	18
weniger interessiert	26	25	25	25	25	23	33	22	29	21	18
gar nicht interessiert	49	44	40	41	39	20	22	42	46	56	58

Basis: Onlinenutzer ab 14 Jahren in Deutschland (2008: n=1 186; 2007: n=1 142; 2006: n=1 084).

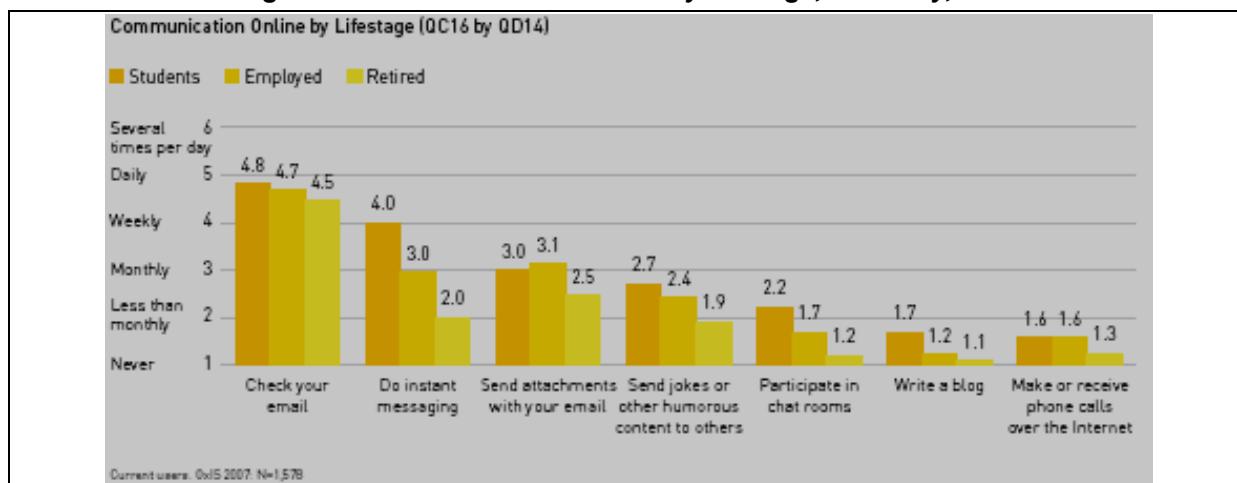
Source: Fisch & Gscheidle (2008: 360), based on data from the ARD/ZDF Online Studie 2006-8

In general, uptake of many so-called Web 2.0 applications in Germany seems to be for passive entertainment rather than for active involvement, as Figure 19 indicates. The big exception are private social networking sites, which are visited actively by roughly half of all persons who use them.

Figure 19: Use of Web 2.0 applications in Germany, 2007-2008 (in % of all Internet users aged 14+)

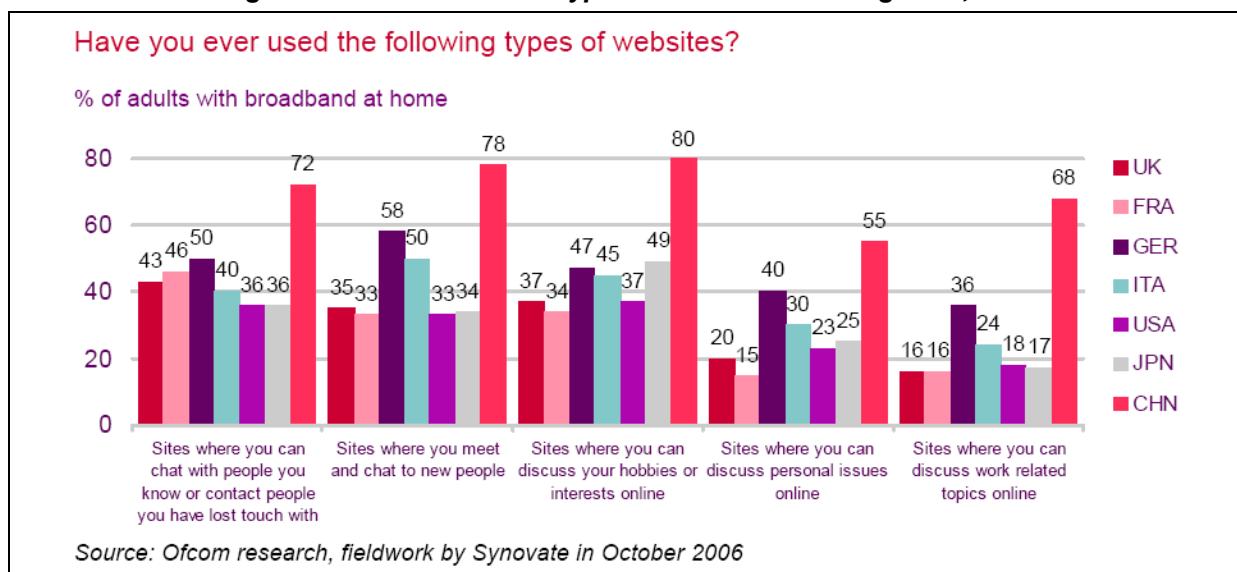
Source: Fisch & Gscheidle (2008: 361), based on data from the ARD/ZDF Online Studie 2008

Data from the U.K. also suggest that high growth rates for take-up of social applications of the Internet hide considerable differences between subgroups of Internet users, in particular between students, people in employment and the retired (see Figure 20).

Figure 20: Communication online by lifestage, U.K. only, 2007

Source: Dutton & Helsper (2007: 55)

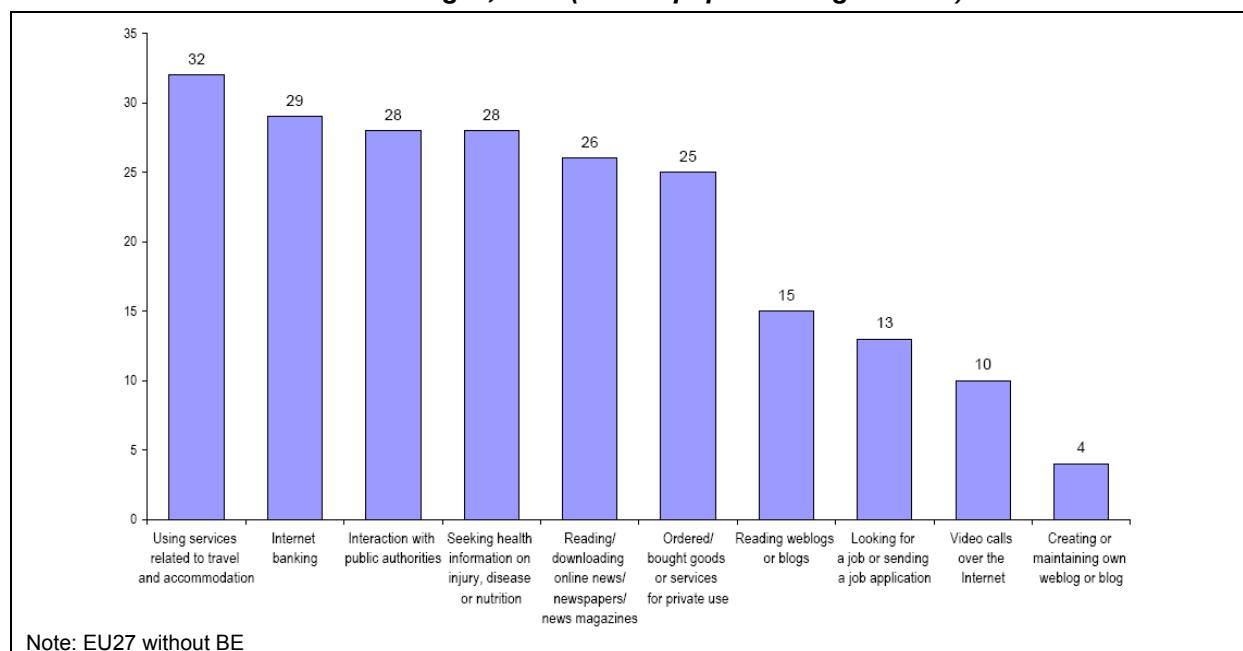
Data from the a representative 2006 survey conducted on behalf of **OFCOM**, the UK telecoms regulator, and covering four EU Member States as well as USA, Japan and urban China suggest that broadband Internet users make strong use of social networking sites for a whole range of purposes, including work-related activities (Figure 21).

Figure 21: Use of different types of social networking sites, 2006

Source: OFCOM (2006)

Data are also available from the **European Community Survey on ICT Usage in Households and by Individuals**. Figure 22 shows how use of weblogs (differentiated in passive and active use) compares to more traditional uses of the Internet. On average, only 4% of the adult EU population are maintaining a weblog, while 15% read weblogs at least occasionally.

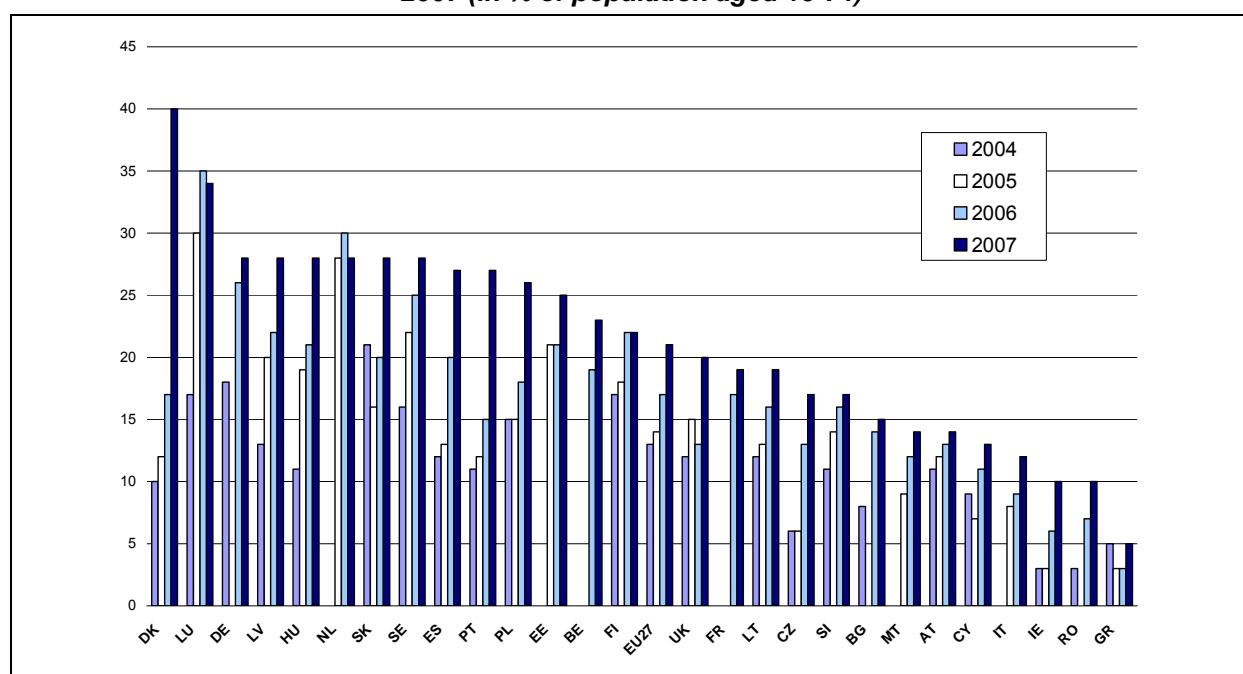
Figure 22: Use of basic and advanced online services in the last 3 months for private purposes, EU27 averages, 2008 (in % of population aged 16-74)



Source: Eurostat (2008)

Of course, weblogs are only one of the online services which are related to the issue of social networking. Until 2007, the Community survey used a category “other communication services” to cover applications such as chatting, online discussion boards and messenger services.

Figure 23: Use of “other communication services” on the Internet (e.g. chat, messenger), 2004-2007 (in % of population aged 16-74)



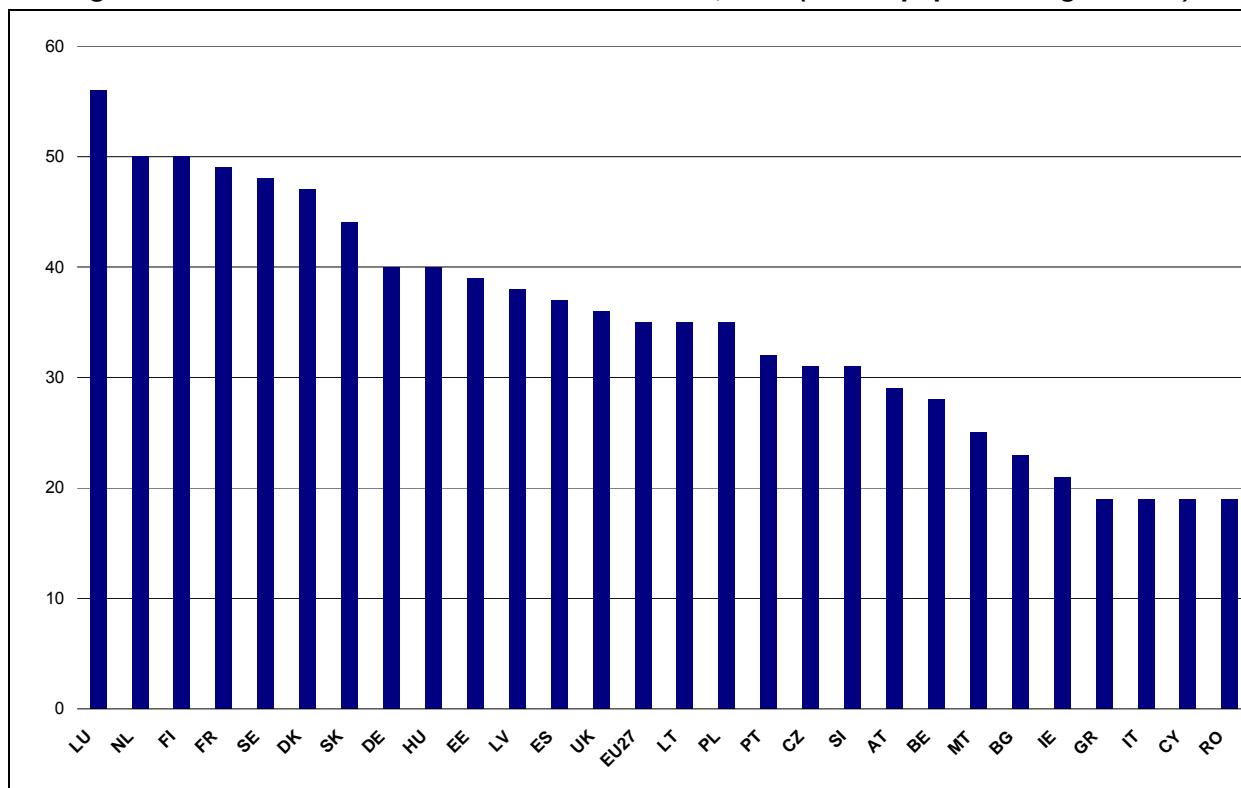
Source: Eurostat database [accessed 2009-03-02, 16:00]

Figure 23 shows that uptake of these services has grown considerably between 2004 and 2007 in almost all EU Member States for which data are available. The EU27 average was

13% in 2004 and 21% in 2007. The spread is highest in Denmark (40% of total population) and Luxembourg (34%).

The 2008 Community survey featured a list of so-called advanced Internet services, which includes phone and video calls over IP, posting messages to chat sites, newsgroups or discussion forums, instant messaging reading blogs and creating blogs. As Figure 24 indicates, the share of Europeans who use at least one of what are also called Web 2.0 applications is significant in all Member States. On average, more than one in three Europeans are users of advanced Internet services. The figure is much higher in Luxembourg, the Netherlands, France and the Nordic countries, while Romania, Cyprus, Italy and Greece, in particular, count much fewer users.

Figure 24: Use of Web 2.0 services¹⁴ on the Internet, 2008 (in % of population aged 16-74)



Source: Eurostat database [accessed 2009-03-02, 16:00]

These statistics confirm that services which are subsumed under the term “Web 2.0” have attracted significant interest among Internet users. This applies, in particular, to social networking services which present individuals with an easy-to-use and highly effective means to get to know other people with similar interests, and interact with them in ways which can be tailored to the preferences and needs of each user. What impact do these services , together with more established ICT applications such as e-mail and SMS texting, have on sociability?

¹⁴ This includes: a) Telephoning over the Internet, b) Video calls (via webcam) over the Internet, c) Posting messages to chat sites, newsgroups or on-line discussion forum, d) Use of instant messaging (real-time communication with others by typed text), e) Reading weblogs or blogs, f) Creating or maintaining own weblog or blog

3.2.2 Impacts on sociability

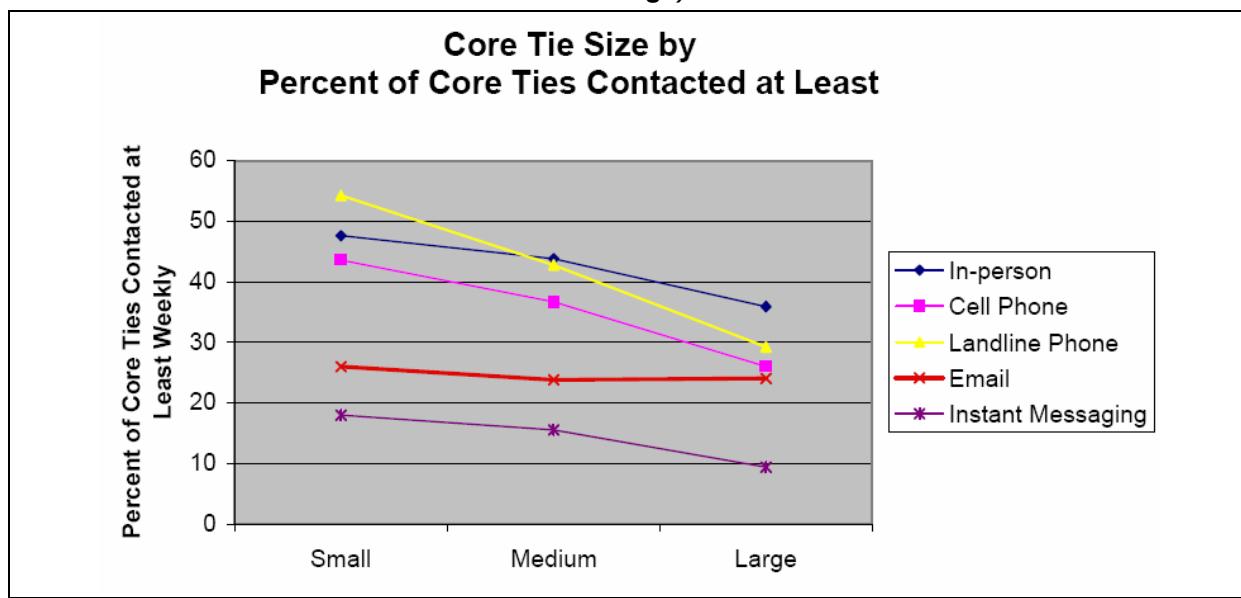
The earliest evidence comes from a 2004 survey by **Statistics Finland**, according to which about 70% of Internet users agreed “fully” or “to some extent” with the statement “With e-mail you contact people that you otherwise wouldn’t” (Nurmela et al., 2006: 58). Research by Statistics Finland (Nurmela, 2006) established significant correlations between ICT use and components of social capital, with the most significant being with community involvement (participation in voluntary or leisure activities). They also found significant correlations between use of ICT (especially number of phone calls and SMS messages) and several components of social capital (e.g. size of the social network, community involvement)(cf. OECD, 2008a: 23):

For the USA, the **Pew Internet & American Life Project** has carried out a number of surveys in order to better understand the social impacts of ICT. Unfortunately, none of their surveys cover more than the USA. Among the most interesting observations of their study on “the strength of Internet ties” (Boase et al. 2006) are findings related to the role of e-mail and the Internet for social networks. The researchers found evidence that:

- “Email is more capable than in-person or phone communication of facilitating regular contact with large networks”
- “Email is a tool of ‘glocalization’. It connects distant friends and relatives, yet it also connects those who live nearby.”
- “Email does not seduce people away from in-person and phone contact.”

Support for the first statement was found when analysing the effect which changes in the size of networks of social ties have on the frequency of contacting these ties at least once a week. Figure 25 shows that as “there are only 24 hours in a day, and so it is not surprising that the amounts of time people spend on in-person and phone contact with their [social] ties, on a percent basis, decreases when they have large networks” (Boase et al. 2006: 15).

Figure 25: Relationship between size of network of social ties and frequency of contact (Pew findings)



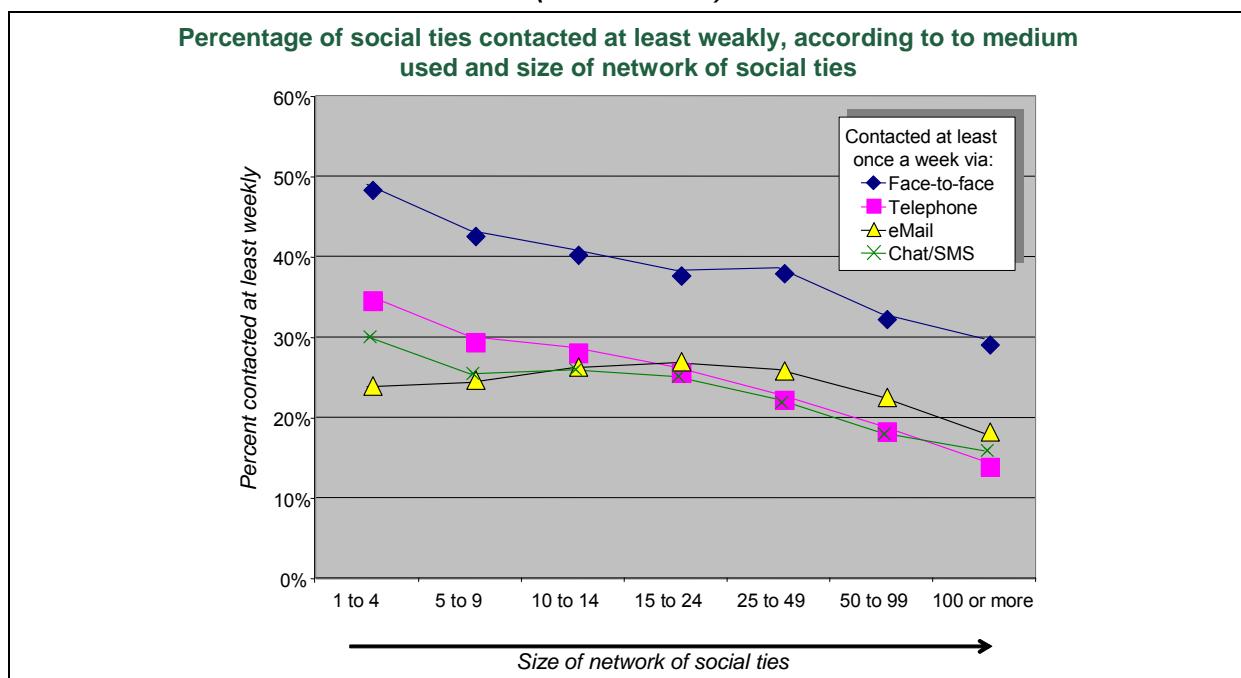
Source: Boase et al. (2006): 16

However, “it is a different story for email: People contact the same percentage of [social] ties at least once per week regardless of whether their networks are large, medium, or small. This means that a greater number of social ties are contacted by email in large networks. For

example, two people contact 50% of their network ties, but Person A contacts only 5 people in his small network of 10 people whereas Person B contacts 15 people in her large network of 30 people" (*ibid.*). This finding is of some relevance as it suggests that e-mail is of high instrumental value for maintenance of weak ties, since they are typically much more numerous compared to strong ties and as such more difficult to maintain by means of face-to-face or telephone communication. It appears that, in particular, the one-to-many functionality of e-mail and other ICTs (instant messaging, texting) enables maintenance of larger networks of social ties.

Can we find such evidence in Europe as well? In order to test this hypothesis, the 2008 **TRANSFORM** survey included an extensive module on social ties, their structure and diversity and the means with which these are being contacted (cf. Gareis et al., 2008). **TRANSFORM** conducted a representative survey among regular Internet users in 12 EU regions¹⁵

Figure 26: Relationship between size of network of social ties and frequency of contact (TRANSFORM)



Source: **TRANSFORM** (2008), based on data from **TRANSFORM** 12 Region Internet User Survey

Results which directly relate to the Pew Internet-derived results from Figure 25 are presented in Figure 26¹⁶. For grouping different sizes of the personal network of social ties, a finder grading was used in order to add precision to the analysis.

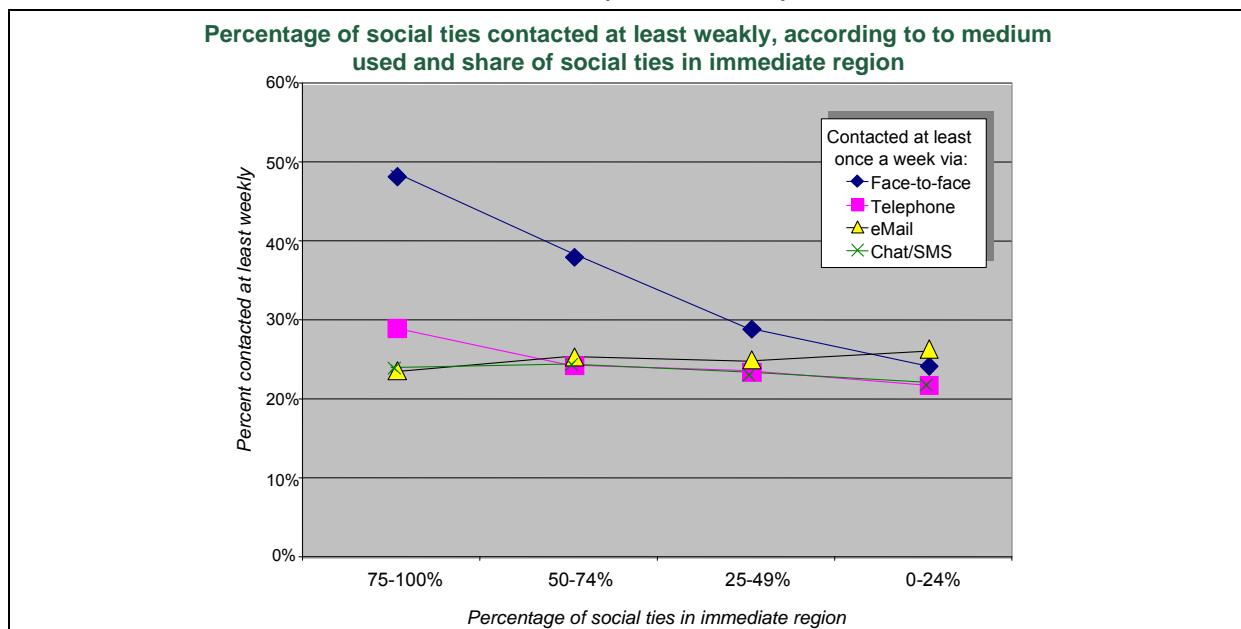
¹⁵ The **TRANSFORM** regional population survey was conducted in late 2007/early 2008. Data collection was designed as an Internet user survey with the universe set as the total online population aged 18-64 in twelve EU NUTS 2 regions: Poland: (a) Pomorskie, (b) Malopolskie; Slovakia: (a) Bratislavsky Kraj, (b) Vychodne Slovensko; Germany: (a) Schleswig-Holstein, (b) Thüringen; Sweden: Mellersta Norrland; Italy: Emilia-Romagna; Spain: (a) Navarra, (b) Extremadura; UK: (a) South Yorkshire, (b) East Anglia. Sample size: At least 300 successful interviews per region, except Slovakia: 200 interviews per region. Total sample size: 3588

¹⁶ Note that while the Pew Internet study differentiated between "core ties" and "significant ties" (which appears to have been an – not fully successful – attempt to separate "strong ties" from "weak ties" as discussed in the social capital literature). Rather than to replicate this approach, the **TRANSFORM** survey only asked for one type of social ties, operationalised as follows: "We would like to ask you about those people in your life you feel close to, but are not part of your immediate family. With immediate family we mean = parents, grand parents, siblings, children, grand children and in-laws. By "feeling close" we mean people who are not just

In line with the findings from Pew Internet, we can observe that the share of social ties which are contacted at least once per week per phone or face-to-face is decreasing significantly with increasing network size. The same is true, to a somewhat lesser extent, for contacts via text messaging. Again as in the Pew Internet study, the pattern for contacts via e-mail or instant messaging is markedly different: For social networks up to a size of 50 persons, the curve is if anything rising rather than falling, and only sags for social networks of very large size (more than 50 persons). The latter suggests that there are limits to the possibility of keeping regular contact to large networks of social ties. Nevertheless, the fact that the share of people contacted at least weekly via e-mail appears more or less independent from the size of the network up to a size of around 50 people indicates that e-mail is indeed a powerful means to maintain individual social capital.

The same patterns can be observed when we look at the relationship between the geographical spread of social network of ties and the share of these ties which are contacted at least once a week (see Figure 27). While the share of social ties contacted at least weekly drops considerably the more of these are located outside of the immediate region (typically: NUTS 3 region), the negative correlation is much less pronounced for contacts by telephone and by text messaging, and does not show at all for contacts via e-mail. The capability of e-mail to enable social ties which spread across distance is well reflected in these data.

Figure 27: Relationship between geographical spread of network of social ties and frequency of contact (TRANSFORM)



Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

Research into social capital is usually also concerned with group membership as an indicator for civil participation and individual-level investment in social capital, usually outside the sphere of work. The TRANSFORM survey explored group membership as well, adding a question about the ways in which respondents communicate with other people in the group(s) they are member of. According to the results, 65% have been members of any type

casual acquaintances but people you discuss important matters with, you keep in touch with, and who are there for you when you need help." Weak ties as defined in the literature are dealt with in a separate question which asks whether the Internet has had an affect on the number of "people you communicate with at least occasionally for private purposes" and "as part of your job", respectively.

of group (business or professional association; a sport club or league; a religious organization; a hobby group or club; a neighbourhood, school, charity, voluntary or any other local group; a political or activist group; or any other group or organization) in the three years prior to the survey. The question asks whether respondents have actively taken part in decision-making and discussion within any group they are member of, in order to distinguish between active and passive group member only.

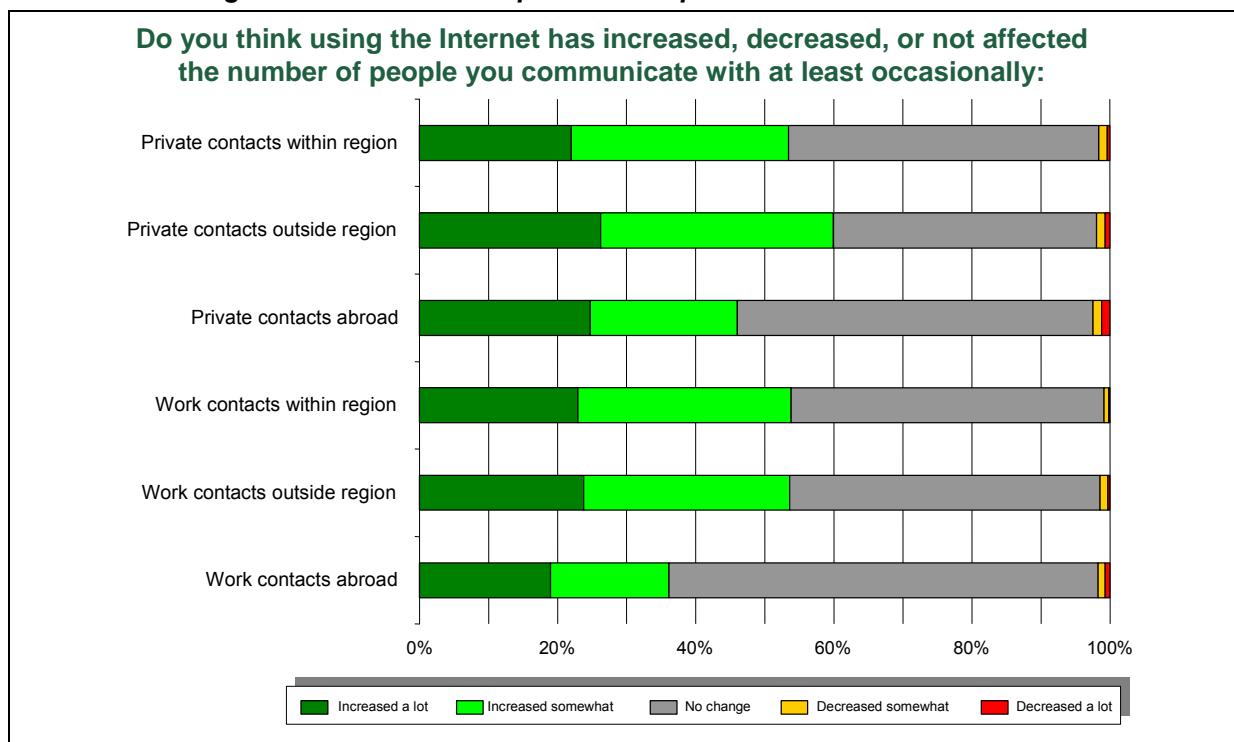
What, now, is the correlation between active participation in groups with the use of ICTs for making contacts within groups? It has been argued that extensive use of ICTs is detrimental for civil participation, as face-to-face contacts are replaced by media-poor ICT-mediated contacts, such as via e-mail, chat or instant messaging. The results presented in Table 39, however, show that strong use of e-mails and other ICT for making contacts within groups goes hand-in-hand with a stronger participation in day-to-day decision-making within these groups. It would, of course, be misguided to suggest a direct causal relationship; instead, the data reflect the fact that strong participation in decision-making increases the utility of e-mail & co. for communication, while frequent use of ICTs makes it more likely that people participate in day-to-day decisions within groups.

**Table 39: Relationship between active group membership and ICT use
(% of those with group membership)**

	Use of e-mail, etc for contacting group members				Total sample
	Never	Several times per year to once a month	About once a fortnight to once a week	At least 2-3 times a week	
Passive group membership only	74.6	36.3	22.8	15.2	37.6
Active group membership (participation in decision making) several times per year to once a month	14.6	44.9	27.5	13.0	21.3
Active group membership (participation in decision making) about once a fortnight to once a week	7.7	13.5	35.9	28.1	21.5
Active group membership (participation in decision making) at least 2-3 times a week	3.1	5.2	13.8	43.7	19.6
Total	100	100	100	100	100

Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

The TRANSFORM survey also asked respondents directly whether they think that the Internet has had an effect on the number of people they communicate with at least occasionally. This is a very simple operationalisation of the notion of "weak ties" as suggested by Granovetter. Theoretical accounts of the relationship between ICT use and weak ties have repeatedly concluded that the Internet is likely to increase the number of weak ties as it diminishes the costs of keeping in (loose) contact with a large number of people. The TRANSFORM data reported in Figure 28 give confirmation to this proposition: More than one in two respondents state that the Internet has increased their number of private weak ties within the region as well as within the country. 46% also felt an increase in occasional contacts with people abroad. The numbers are somewhat smaller for work-related contacts. For all of these types of contacts with the exception of work contacts abroad, the share of respondents who perceive a strong increase as a consequence of the Internet is between one in four and one in five.

Figure 28: The Internet's perceived impact on number of weak ties¹⁷

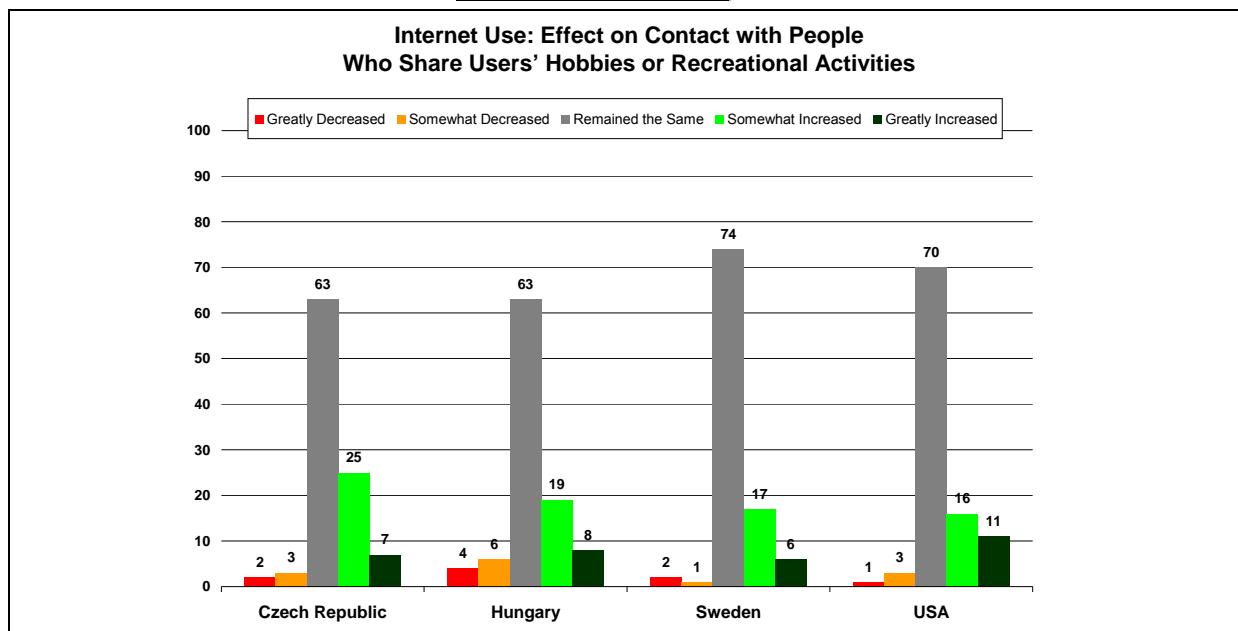
Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

Comparable statistical evidence is available from other sources as well. The **World Internet Project**, a series of harmonised population surveys on a large number of Internet-related topics, provides data on the perceived effect of respondents' Internet use on their contacts to different groups of people. As the following charts show (Figure 29 to Figure 32), the majority of Internet users in the countries surveyed report that the frequency of contact with other people has not changed. Still, a sizeable minority states that the Internet has had a positive effect on contacts with people who share the same hobbies or recreational activities (Figure 29) – from 23% in Sweden to 33% in the Czech Republic. Results are similar with regard to contacts with people who share one's profession (Figure 32) but more inconclusive with regard to contacts who share one's political interests (Figure 30) and religious interests (Figure 31). At least in Hungary¹⁸ some Internet users have experienced that the frequency of contacts to these groups of people has decreased as a result of using the Internet. This raises the question whether, in particular, religious beliefs will suffer from the spread of the Internet and online communication.

¹⁷ Lower three columns: People in employment or self-employed only.

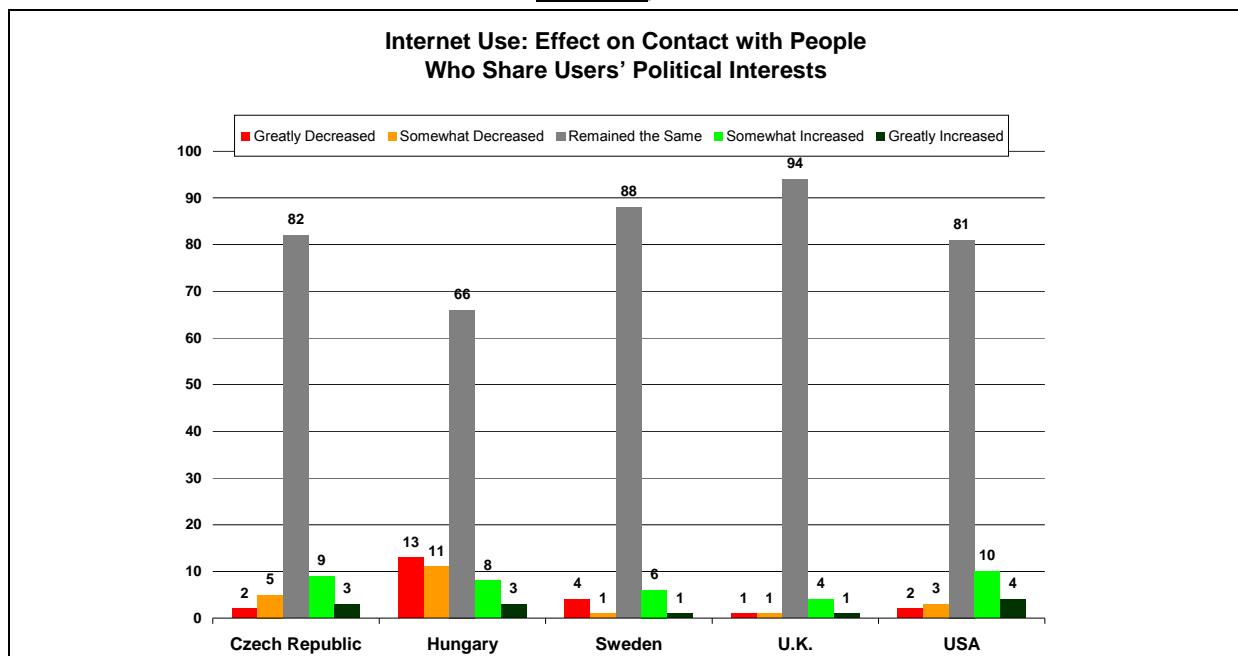
¹⁸ And in some other non-European countries not depicted here, see WIP (forthcoming)

Figure 29: Perceived effect of Internet use on contact with people who share one's hobbies or recreational activities, 2007



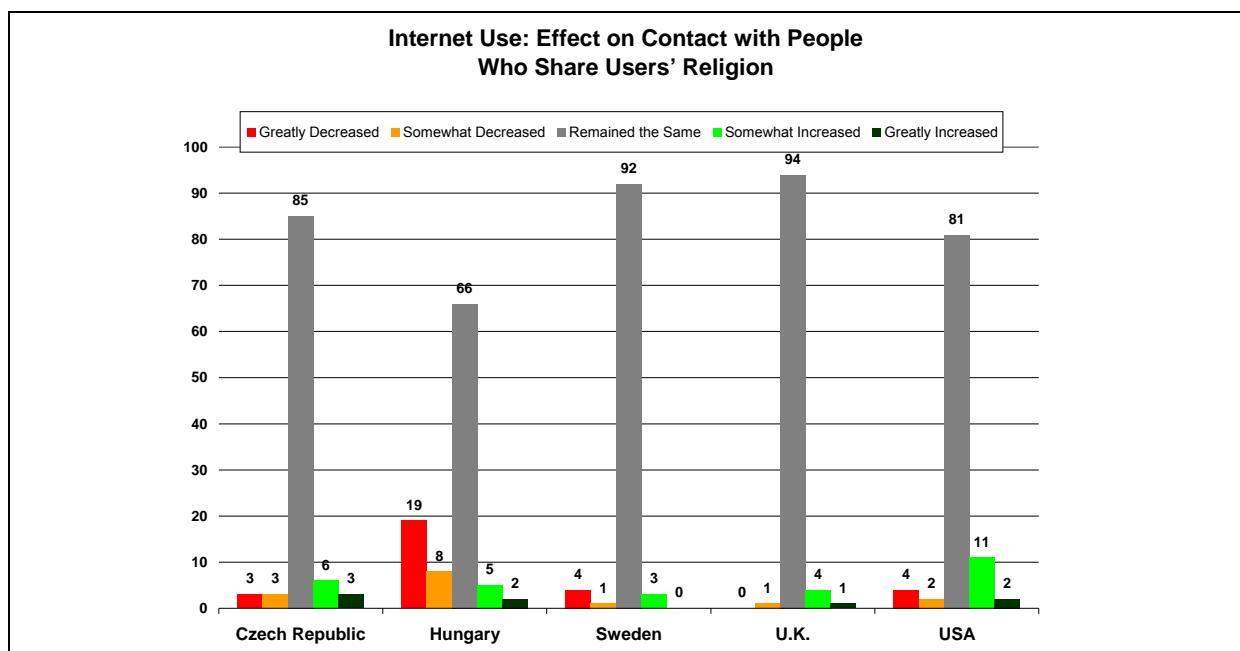
Source: The authors, based on WIP data, 2009

Figure 30: Perceived effect of Internet use on contact with people who share one's political interests, 2007



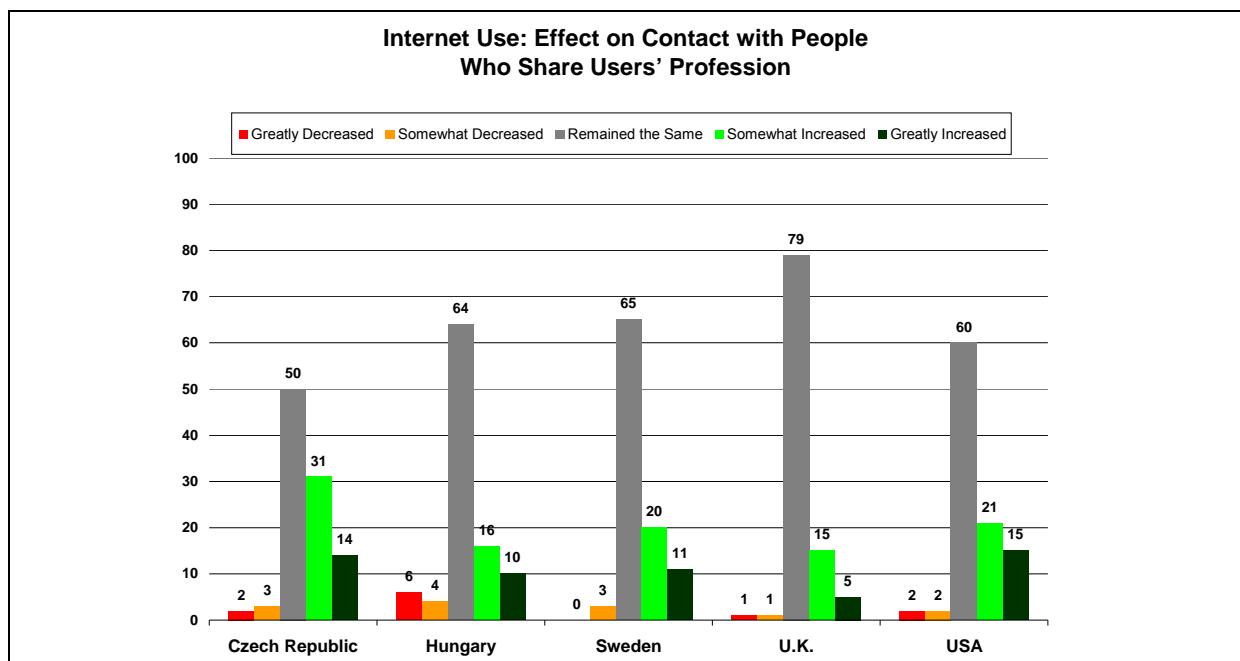
Source: The authors, based on WIP data, 2009

Figure 31: Perceived effect of Internet use on contact with people who share one's religion, 2007



Source: The authors, based on WIP data, 2009

Figure 32: Perceived effect of Internet use on contact with people who share one's profession, 2007

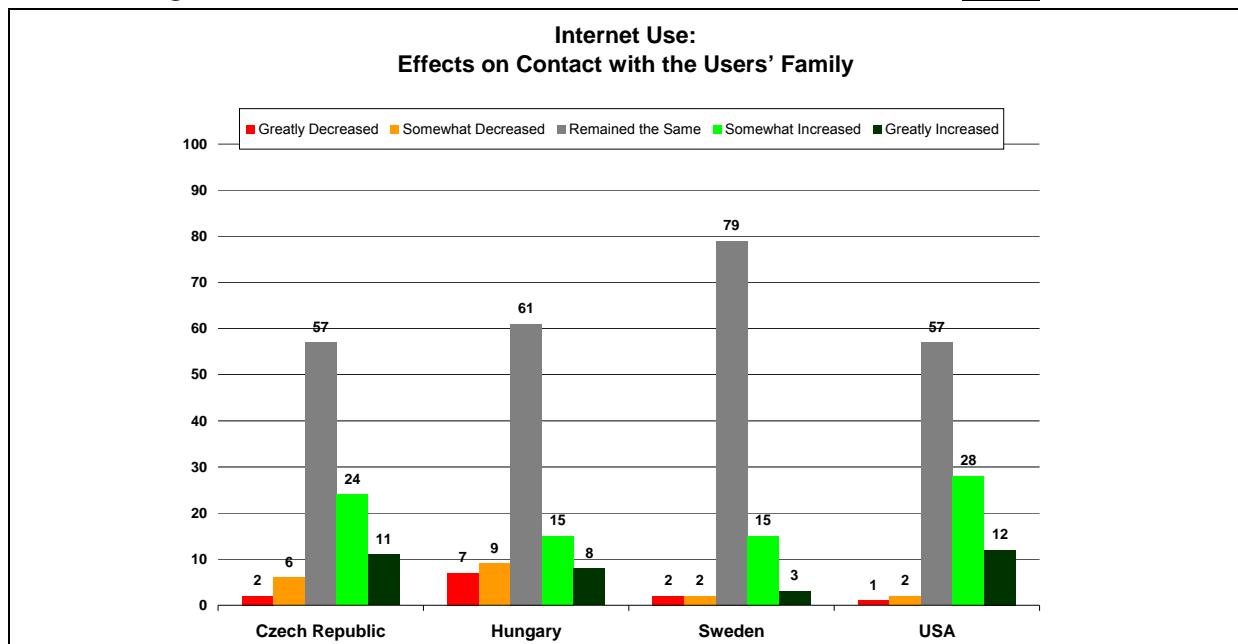


Source: The authors, based on WIP data, 2009

The **World Internet Project** data also provides insight into user perceptions about the Internet's impact on their interaction with friends and family (Figure 33 to Figure 36). On average, most Internet users report there has not as yet been any tangible change to the frequency of contacts and to the time spent with friends and family. Those who state that there has been a change predominantly report that the number of contacts has increased

rather than decreased: Between 18% (Sweden) and 40% (USA) experienced an increase in contacts with their family, and between 26% (Sweden) and 53% (Czech Republic) say there has been an increase in contacts with friends. This implies that significant shares of the population in the countries covered by the survey have already experienced positive impacts of the Internet on their ability to stay in touch with friends and family.

Figure 33: Perceived effect of Internet use on contact with one's family, 2007



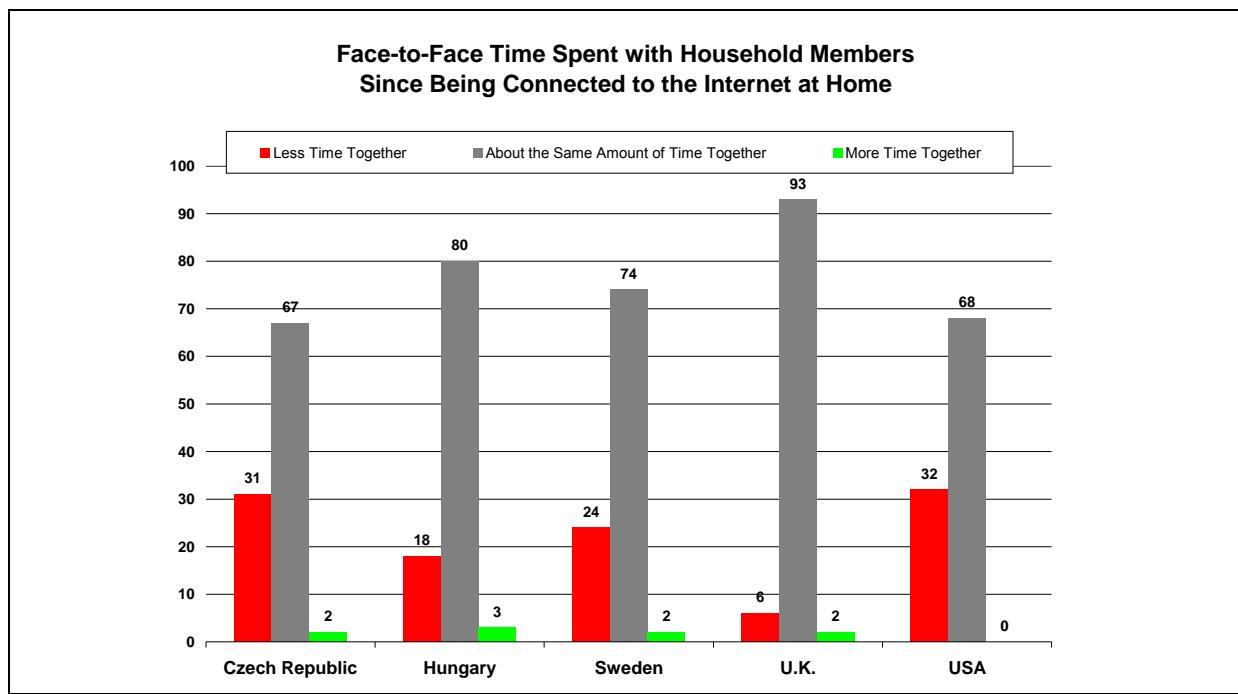
Source: The authors, based on WIP data, 2009

On the other hand, however, a sizeable minority of Internet users reports that the time spent engaged in face-to-face interaction with household members (Figure 34) and – to a lesser extent – with friends (Figure 36) has decreased as a result of them using the Internet. Between 6% in the U.K. and 32% in the USA say that they spend fewer hours with household members at home.

In sum, the WIP data suggest that the effect of the Internet on sociability is predominantly neutral to positive, with increasing contacts reported, in particular, for friends, people who share the same recreational activities and people who share the same professions. There are some indications that contacts of a religious nature might suffer from Internet use. Moreover, there is a tendency for less time being spent with household members.

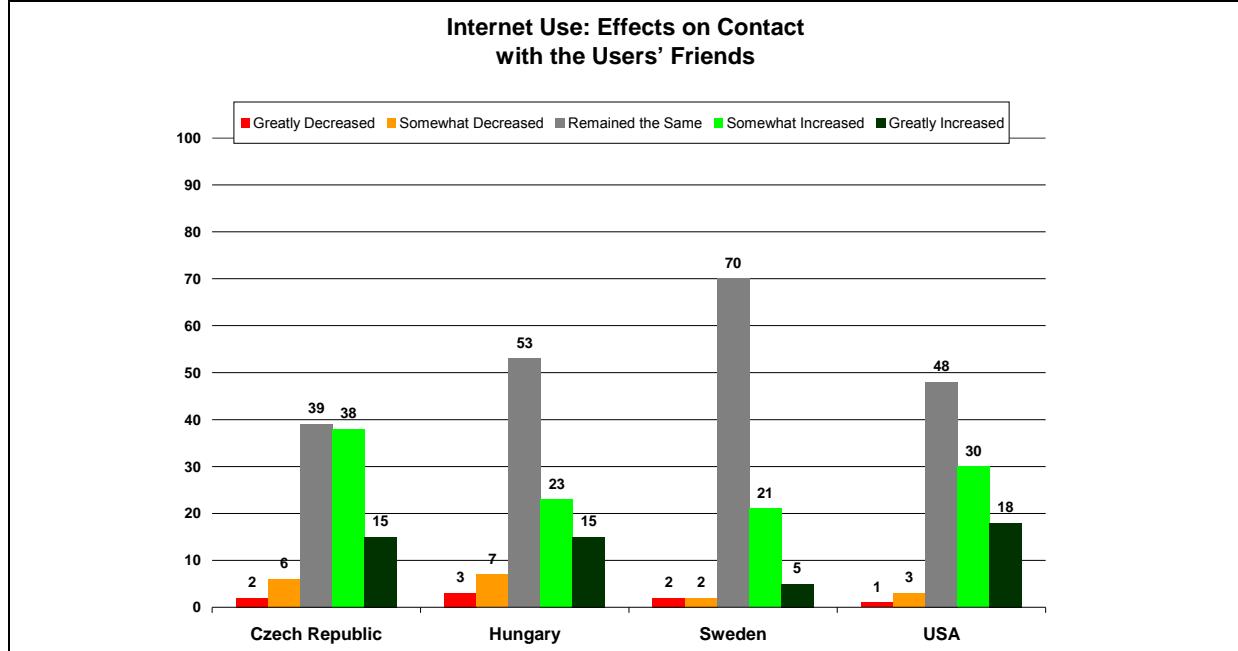
More specifically, what emerges is a picture where interaction with remote friends and family members gets stronger at the expense of interaction, especially face-to-face contacts, with those people who are in the direct vicinity (such as the household). This would also imply a partial substitution of ICT-mediated communication for face-to-face interaction, albeit not necessarily with the same persons.

Figure 34: Perceived effect of Internet use on face-to-face time spent with household members, 2007

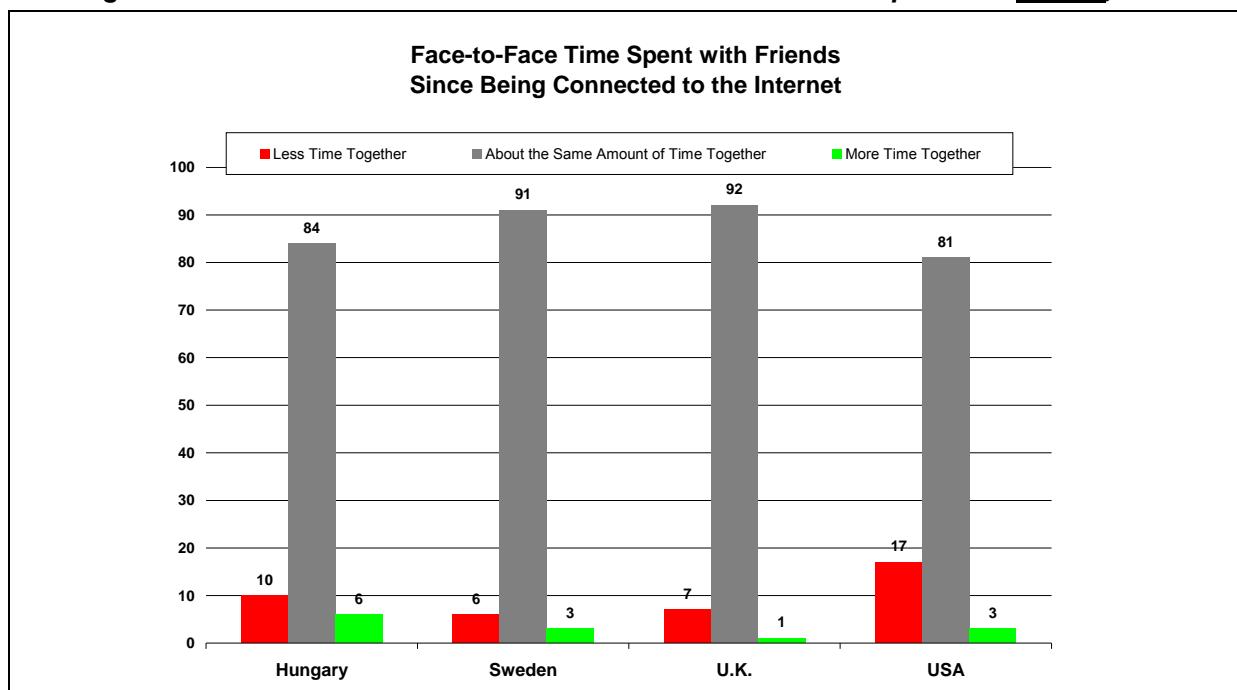


Source: The authors, based on WIP data, 2009

Figure 35: Perceived effect of Internet use on contact with one's friends, 2007



Source: The authors, based on WIP data, 2009

Figure 36: Perceived effect of Internet use on face-to-face time spent with friends, 2007

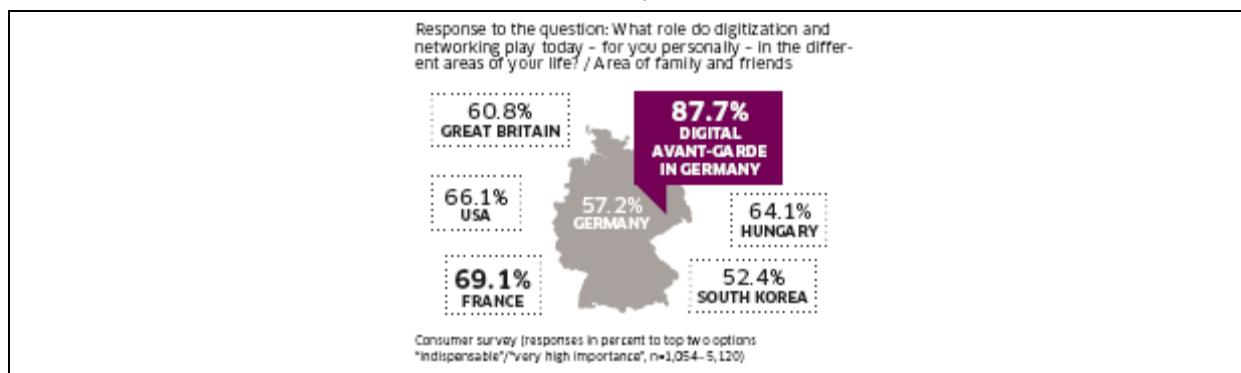
Source: The authors, based on WIP data, 2009

The Oxford Internet Survey includes questions on meeting people online (Dutton & Helsper, 2007: 57). In response to the question “Have you ever met new people on the Internet that you did not know before?”, somewhat less than a quarter (23%) of Internet users in the U.K. report they have met an online friend they did not know before going on the Internet – an increase of 3 percentage points over the 2005 figure. Men were found to be more likely than women to meet new people online in the U.K., and students were found to be more than three times more likely to make online friends than retired Internet users.

The OxIS researchers also wanted to know whether contacts made over the Internet sometimes lead to meeting face-to-face, i.e. to what extent online friends can become friends in the “physical world” (Dutton & Helsper, 2007: 57). The related question was worded as follows: “Thinking back to all the people you have met on the Internet, have you gone on to meet any of them in person?” The survey found that about half (47%) of those who have met someone online have gone on to meet them in person. This translates into almost 12% of Internet users (half of 23%) who in 2007 have gone on to meet someone offline whom they have met online in the first place (cf. di Gennaro & Dutton, 2007).

The LIFE – Digitales Leben survey, conducted in December 2008 using a representative sample of Internet users in six countries, found that between 52% (South Korea) and 69% (France) of Internet users consider ICT-based networking as “essential” or “very important” for the sphere of “friends and family” (Figure 37). Among advanced users (what the study calls “digital avant-garde”), the figure is much higher (88% in Germany).

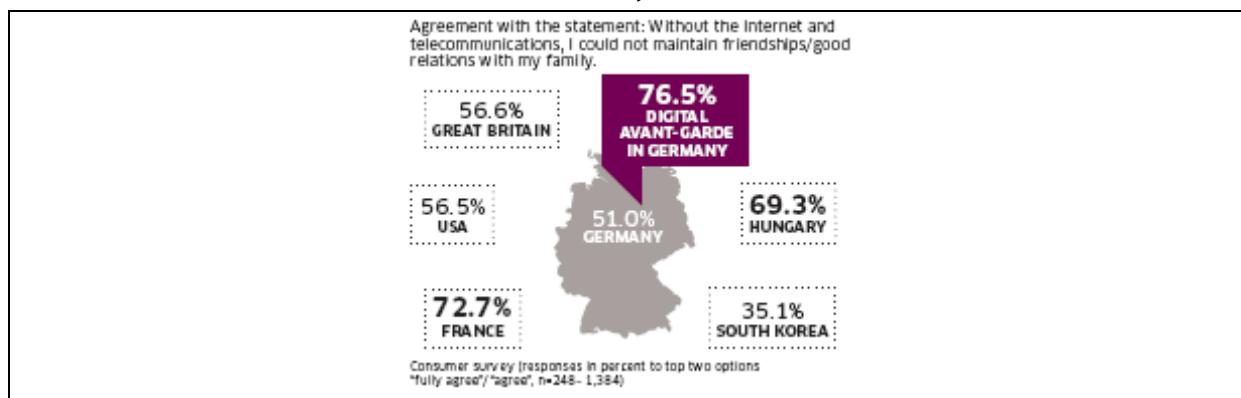
Figure 37: Perceived importance of digitisation and networking for the area “family and friends”, 2008



Source: Hess et al. (2009: 16)

The share of Internet users who “agree fully” or “agree” to the statement “Without the Internet and telecommunications it would be impossible for me to maintain my contacts to friends and my family” is 51% in Germany, 57% in the U.K., 69% in Hungary and 73% in France (Figure 38).

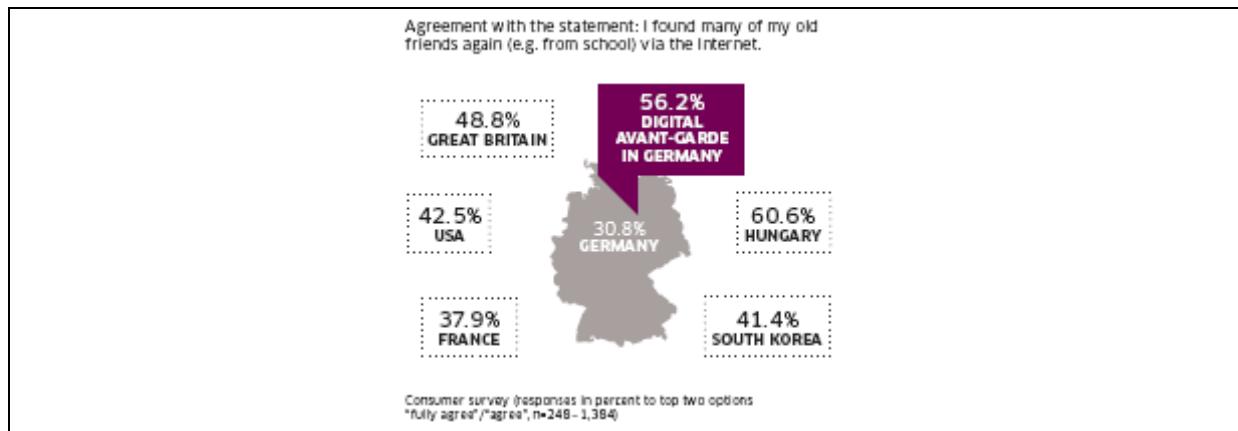
Figure 38: Perceived importance of the Internet and ICT for maintaining contact with family and friends, 2008



Source: Hess et al. (2009: 34)

Between 31% (Germany) and 61% (Hungary) of Internet users report that they have reconnected with old friends via the Internet (Figure 39).

All of these results indicate that Internet users are well aware of the role which the Internet plays for sociability, and that they tend to perceive impacts on sociability as positive.

Figure 39: Getting back in touch with old friends, 2008

Source: Hess et al. (2009: 34)

3.3 Impacts on quality of life

One of the few datasets which allow for analysis of the direct effect of ICTs on individual social indicators was produced in the context of the eLiving project (Anderson et al., 2007). The study used a panel survey of about 1000 individuals in private households spread across six countries (Bulgaria, Germany, Israel, Italy, Norway, UK). Unfortunately, the two waves of data collection were separated by twelve months only, which means that only short-term impacts and changes can be detected.

A number of analyses were carried out using the dataset. By means of ordinary linear regression analysis, Anderson (2007) investigated whether he could find a statistical effect of ICT-related changes (got Internet access, got mobile phone, increased time spent online, increased frequency of selected online activities) on objective and subjective quality of life (QoL). The latter was operationalised as overall life satisfaction. A large number of control variables were included in the analysis. According to the results of the analysis, there was no significant effect of getting access to the Internet on perceived quality of life. However, “the change in time spent on the Internet is positively associated with change in QoL in all countries except the UK, and the result is significant in Italy and Bulgaria” (Anderson, 2007: 170). While this cannot be interpreted as conclusive evidence about a positive impact (because of the limited strength and statistical significance of the result), it at least indicates that it is not Internet access itself which makes a difference, but the intensity of use. Another interesting finding from the analysis is that changes in people’s satisfaction with the quality of communication with friends tend to have a significant impact on perceived quality of life. This means that ICTs can be expected to have a tangible, indirect impact on quality of life insofar they can be shown to have a significant effect on the quality of communication between Internet users and their friends.

Other relevant data comes from the 2008 TRANSFORM study. From the viewpoint of those interested in the application of ICTs for regional development, it is of special relevance to what extent ICTs such as the Internet and mobile networks are being used for communicating with distant contacts at the expense of contacts in the immediate vicinity. This relates to what Boase et al. (2006) call the “replacement hypothesis”, i.e. the claim that the new types of communication that are enabled by new ICTs, e.g. the sending of e-mails or text messages, lead to an equivalent decrease in communication using long established media (e.g. post-delivered letters) or via face-to-face interaction. It has been argued that due to their “distance-shrinking” character, the Internet and other ICT would have an effect, in particular, on the ability of individuals and firms to establish connections with others at far

away locations. An example which was often cited in the early years of Internet-supported business was the local SME which is enabled to sell its produce to a global marketplace, thereby overcoming traditional constraints related to distance. Only later did observers realise that the Internet may exert its most powerful influence where it is embedded in real-world systems of interconnection and communication.

The TRANSFORM survey distinguished between the Internet's perceived importance depending on the geographical scale. Table 40 shows results from a question on the perceived impact of the Internet on the number with which respondents communicate at least occasionally (the survey's working definition of "weak ties"). In Table 40 the relative perceived impact on private contacts within the (NUTS2) region as opposed to outside of the region is depicted. One in three Internet users did not perceive any increase in the number of private weak ties as a consequence of the Internet. One in three respondents, again, felt the impact on the number of weak ties positive, but not much different between both geographical scales. Only 23% of Internet users felt that the effect was bigger for out-of-region contacts than for contacts within the region, while 13% observed the opposite (!). For work-related contacts, both groups are roughly as strong (10 and 11%, respectively).

Table 40: The Internet's perceived impact on number of weak ties – relative impact by geographical scale (intra-regional vs inter-regional)

	Private contacts	Work contacts ¹⁹
Number of contacts within the region has <i>increased more than</i> number of contacts outside of the region	12.9%	10.7%
Number of contacts within the region has <i>increased as much as</i> number of contacts outside of the region	32.2%	38.1%
Number of contacts within the region has <i>increased less than</i> number of contacts outside of the region	22.5%	11.7%
Number of contacts within the country has <i>not increased</i>	32.5%	39.5%
Total	100.0%	100.0%

Source: TRANSFORM (2008), based on data from TRANSFORM 12 Region Internet User Survey

The TRANSFORM findings can be summarised as follows: The Internet has had a tangible influence on the number of persons people communicate with, but in contrast to popular opinion this effect is not necessarily stronger for contacts who live at a distance. 45% of all Internet users state that the Internet has increased the number of their private-life weak ties but that this effect was as strong, or even stronger, for contacts who live in the same region as it was for people living outside of the region.

3.4 Impacts on time use

Internet users spend considerable amount of time online, which has made early observers believe that Internet users may sacrifice time spent on traditional forms of sociability, such as meeting friends, conversing at the telephone, and engaging in civil society (Kraut, 1998; Putnam, 2000). However, no statistical evidence has been produced so far that substitution of offline sociability by online activities is taking place (Katz & Rice, 2002; Shklovski et al., 2006). Based on an analysis of data from the World Internet Project, Dutton et al. (2007: 41) state:

Cross-national data from the WIP surveys supports the view that the Internet has not disrupted existing social relations, with most people thinking that going online had not changed the amount of time they spent with family and friends. Of those that did think

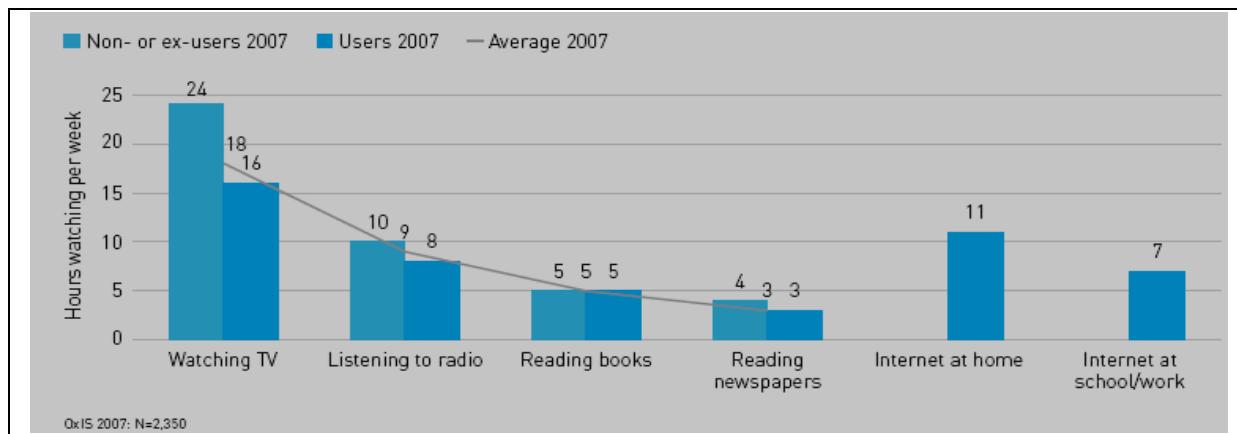
¹⁹ People in employment or self-employed only.

there had been a change, more thought time spent with family and friends had increased rather than decreased as a result of going online.

Most research undertaken so far is consistent with regard to the main activity which has been sacrificed to the time spent online, which is watching television. As Dutton et al. (2007: 43) stress, this “does not give grounds for alarm about the decline of social capital”.

Figure 40 presents data from the latest Oxford Internet survey.

Figure 40: Hours of media use, Internet users compared to non-users, UK only, 2007



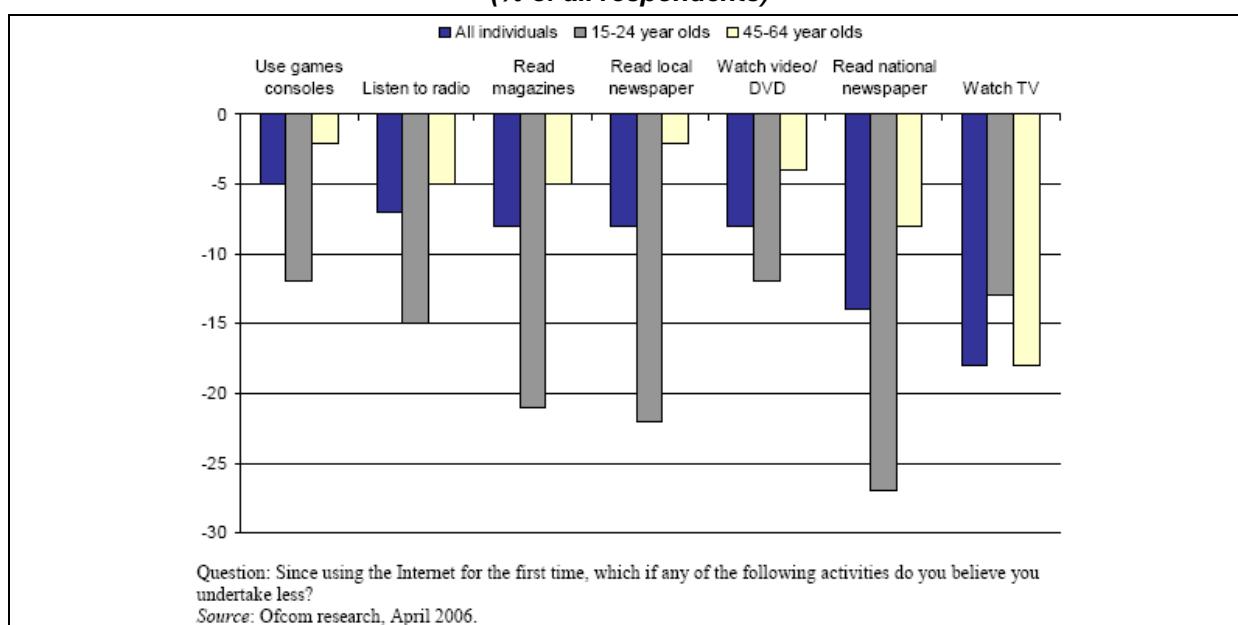
Source: Dutton & Helsper (2007: 24)

According to 2005 data from **Statistics Finland**, slightly fewer than half of medium to high intensity Internet users reported a decrease in TV watching. About two thirds of the same group reported no change in time spent reading or talking on the phone, and 90% reported no change in time spent with friends (Nurmela et al., 2006).

Time use survey data from the **UK**, reported in OECD (2008), show that time spent on computers outside of work has increased markedly between 2000 and 2005. People who do not use computers spend more time on housework (33 minutes difference per day), watching TV (25 minutes), social life (23 minutes), resting (18 minutes) and study time (11 minutes). However, since the groups of computer users and non-users in the UK can be expected to differ in many ways, but especially according to age, educational attainment and income, the differences in time use cannot be interpreted as being a direct effect of computer use.

Data from a study by **OFCOM**, the UK telecoms regulator (Figure 41), suggest that time spent on Internet use is widely felt to have had a negative effect on time spent on watching television, but also on time spent reading newspapers, reading magazines and listening to the radio. While the overall shares of Internet users reporting such effects are modest, among young people aged 15-24 they are significant: More than one in four UK Internet users in this age group is spending less time on reading newspapers as result of using the Internet.

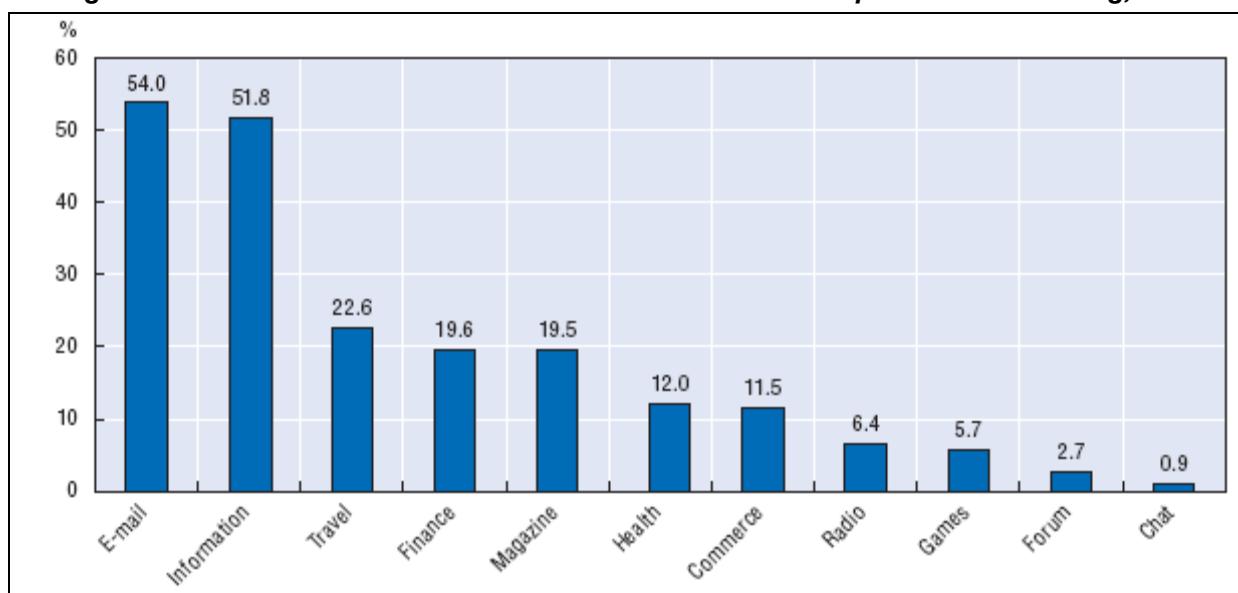
**Figure 41: Reduction of consumption of offline media as a result of Internet use, UK only, 2006
(% of all respondents)**



Source: OECD (2007: 59), based on data from OFCOM

In general, there is much evidence that ICTs – in particular the mobile phone and, to a lesser extent, the Internet – are contributing to the general social trend of diminishing boundaries between spheres of life, e.g. between work and leisure time. The spread of mobile telephony, mobile computing and remote access turn more and more employers, at least potentially, into teleworkers. Job-related activities have started to permeate leisure time and family life, but there is also a complementary movement by which private activities occur during working hours, as the data collected by Poussing show (Figure 42).

Figure 42: Non-business-related use of the Internet at the workplace in Luxembourg, 2004

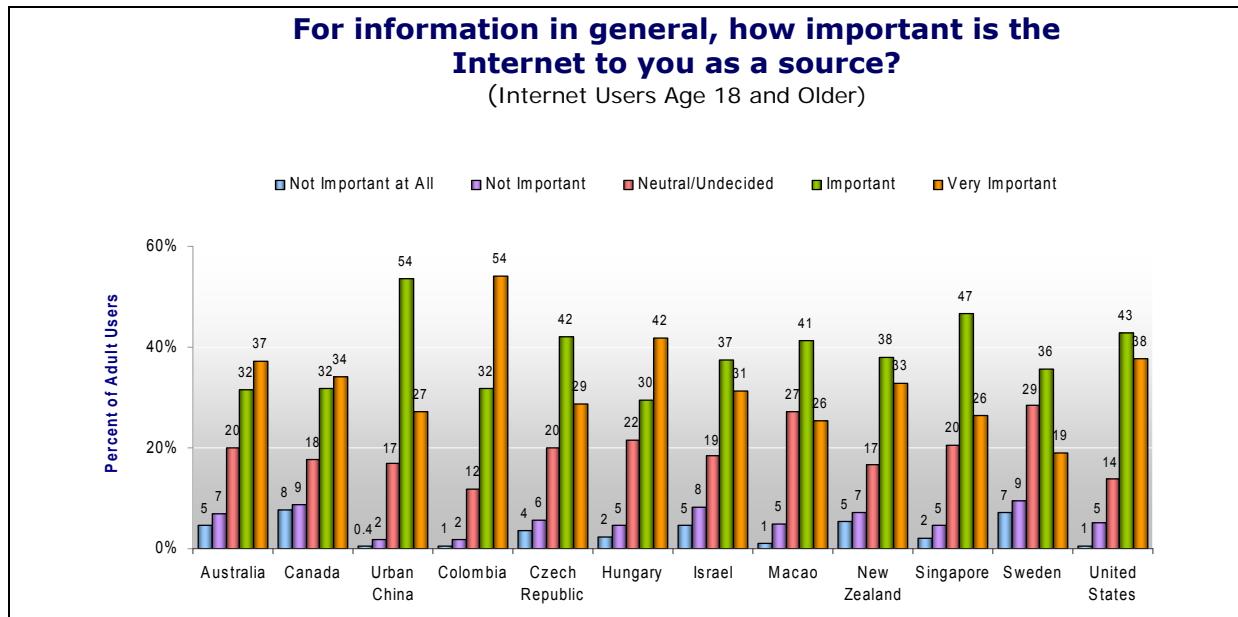


Source: OECD (2008b: 204) based on Poussing (2006)

3.5 Impacts related to information seeking and commercial transactions

Data from the **World Internet Project** confirm that the Internet has become one of the most important sources of information for those who are online (Figure 43).

Figure 43: Perceived importance of the Internet as a source of information, 2007



Source: WIP (2009)

For example, in Sweden 55% of all Internet users consider the Internet “very important” or “important” as a general source of information. In Hungary and the Czech Republic, the figure is even higher (72% and 71%, respectively). As Table 41 indicates, more people consider the Internet an important source of information than the television, newspapers and the radio, with the exception of Sweden, where Internet, newspaper and television are considered important sources of information by roughly the same share of respondents.

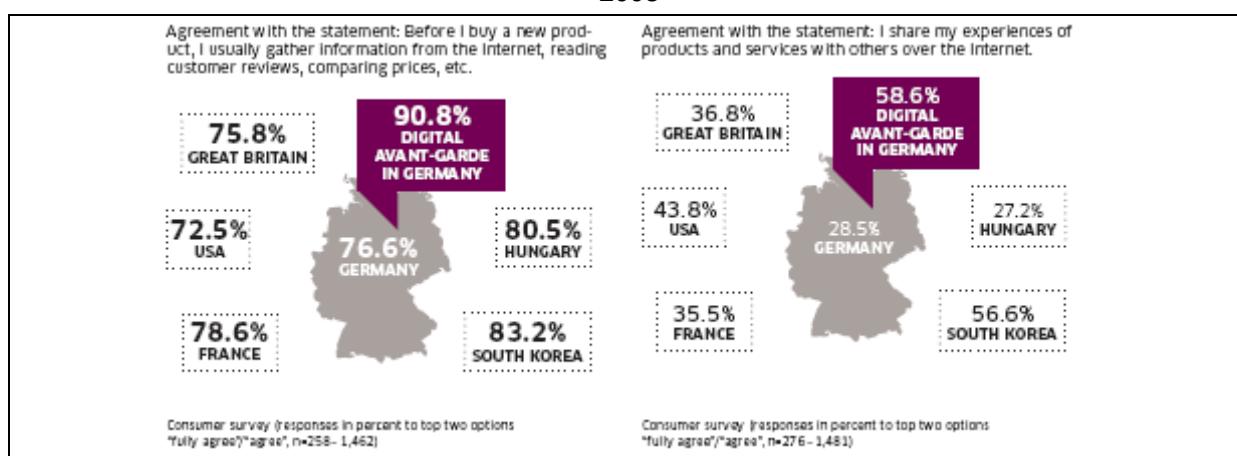
Table 41: Perceived importance of the Internet, television, newspapers and radio as sources of information, 2007

	Internet Users Age 18+ Ranking the Media as “Important” or “Very Important”			
	Internet	Television	Newspapers	Radio
Czech Republic	71	68	55	46
Hungary	72	61	57	55
Sweden	55	56	53	44
United States	81	69	62	64

Source: The authors, based on WIP data, 2009

Information seeking and exchange of consumption-related experiences have become an essential element of the way people prepare purchasing decisions. The 2008 **LIFE – Digitales Leben** survey found that around three out of four Internet users consult online information before purchasing an unknown product (Figure 44, left hand chart). Between 29% (Germany) and 57% (South Korea) feed back their experience with purchased products and services to the online community, by means of user ratings, comments to online shopping portals etc. (Figure 44, right hand chart).

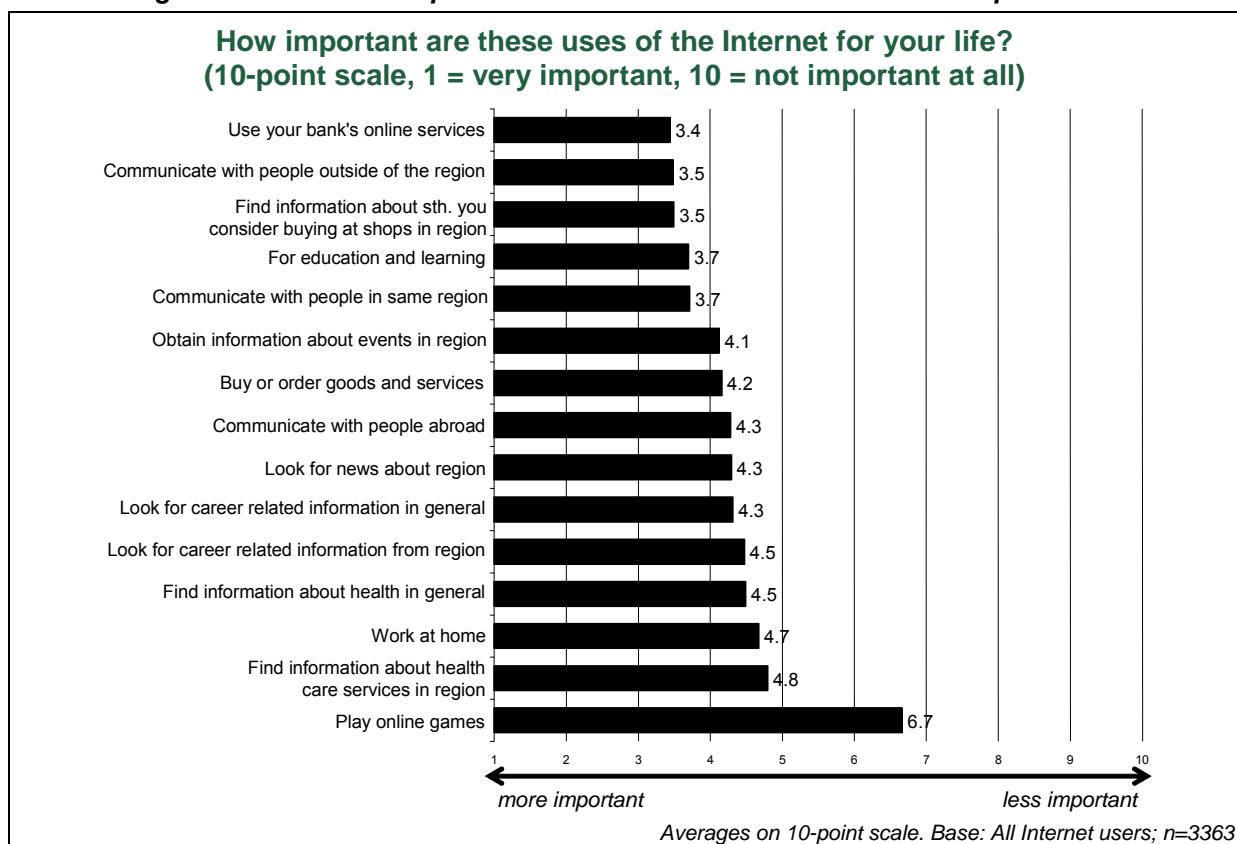
Figure 44: Pre-purchase online information seeking and experience sharing on the Internet, 2008



Source: Hess et al. (2009: 34)

The extent to which the Internet “makes a real difference” to people’s lives is something which, arguably, needs to be analysed by exploring people’s perceptions. Whereas most statistical data which are published attempt to measure whether individuals have used certain applications of the Internet, the 2008 **TRANSFORM** survey presented respondents with a list of possible uses of the Internet and then asked how important these are perceived to be for (a) their private life and (b) using a somewhat different list of items, their ability to carry out their job (if in employment) (TRANSFORM, 2008). Figure 45 shows the uses in the order of the lowest to the highest average importance given by respondents in the full sample.

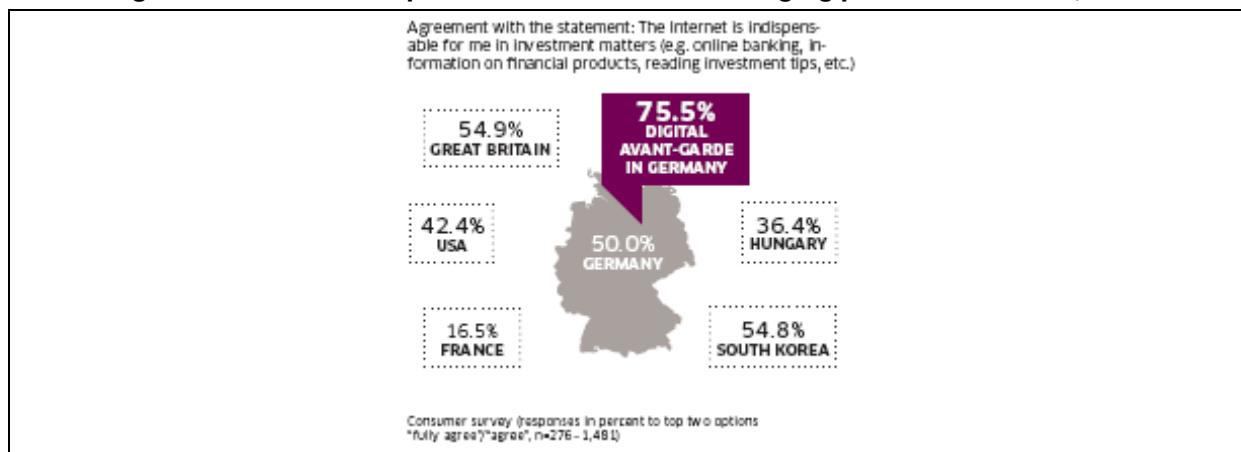
Figure 45: Perceived importance of selected uses of the Internet for private life



It may come as a surprise that commercial functions such as online-banking and pre-purchase information seeking about products and services are among the uses which were considered by respondents – on average – as most important. This indicates that people give high relevance to applications which offer convenience. Other uses which are considered, on average, as very important include communication with people inside and outside of the region, and uses related to education and training. Overall, all uses are given a strong to very strong importance, with the exception of online gaming which appears to be of interest for a small minority of (predominantly young) users only.

The 2008 **LIFE – Digitales Leben** survey found that between 17% (France) and 55% (U.K.) of Internet users consider the Internet an essential or important tool for managing their finances (Figure 46). This relates to applications such as online banking, information about financial products, and investment advice.

Figure 46: Perceived importance of Internet for managing personal finances , 2008



Source: Hess et al. (2009: 43)

While the wealth of information available online can be a valuable source for some individuals or for some purposes, respectively, at other times it is the feeling of information overflow which affects the wellbeing of people. Statistics on perceptions concerning information overflow is available from some sources. A survey conducted by **Statistics Finland** found that slightly more than 80% of men and slightly less than 80% of women agreed “fully” or “to some extent” to the statement “I am not bothered by information overflow [on the Internet]” (Nurmela et al., 2006: 58).

An issue which is related to information overflow is computer anxiety and computer frustration (cf. van Dijk, 2005: 41-41). The Statistics Finland survey presented respondents with the statement “I feel completely overwhelmed by the advance of new information technology” and asked to what extend they agree. While only about 10% in the age group 15-29 years agreed “fully” or “to some extent” to the statement, this share increases with age: Among those aged 50 to 59, more than 40% confirmed that they tend to feel overwhelmed by the advances in ICT.

3.6 Impacts on major decisions in life

A way to address the question of social impacts of ICT from the viewpoint of individuals was suggested by the **Pew Internet & American Life Project** (Boase et al. 2006). As part of their research on the importance of the Internet for US-Americans, Horrigan and Rainie (2006) applied a list of items of what they termed “major decisions in life”, such as finding a new job or a new place to live, dealing with a major illness, etc. For each of these decisions, the Pew

surveys first enquired whether respondents had to deal with it in the reference period, in which case they were then asked what role the Internet played for dealing with the decision. Responses from the 2005 "Major Moments Survey" are reproduced in Table 42.

Table 42: The role of the Internet for major decisions in life (Pew findings)

Using the Internet for Decision-Making				
	Percent of internet users who dealt with the issue	Percent of those who dealt with issue for which internet played crucial role	Percent of those who dealt with issue for which internet played important role	Number of Americans who said the internet was crucial or important
Gotten additional training for your career	39%	21%	18%	21 million
Helped another person with a major illness or medical condition*	49	9	17	17
Chosen a school or college for yourself or your child	29	22	20	17
Bought a car	46	12	15	16
Made a major investment or financial decision*	41	12	17	16
Found a new place to live*	24	15	15	10
Changed jobs*	25	13	12	8
Dealt yourself with a major illness or other health condition*	19	5	23	7

Source: Pew Internet & American Life Project March 2005 Survey. N=1,450 for internet users. The margin of error ±3% for the sample of internet users.* denotes issues asked about in February 2004 "social ties" survey.

Source: Boase et al. (2006): 37

In order to explore whether these findings apply to Europe in a similar way, the 2008 **TRANSFORM** survey used a similar question. For that purpose, a 10-point scale was used for replies (instead of the 4-point scale used in the Pew study) and two items were dropped in order to adapt the question to the European cultural environment. Findings are reproduced in Table 43.

Table 43: The role of the Internet for major decisions in life (TRANSFORM findings)

	Percent of Internet users who dealt with this issue in last 3 years	Percent of those who dealt with issue for which Internet played an <i>essential</i> role ²⁰	Percent of those who dealt with issue for which Internet played an <i>important</i> role ²¹	Importance of the Internet for dealing with issue: Mean on 10-point scale
Made a major investment or financial decision	46.1	25.1	50.8	4.43
Gotten additional education or training for your career	48.4	25.3	51.7	4.27
Chosen a school or college for yourself or your child	32.9	28.4	53.6	4.25
Helped another person deal with a major illness	38.0	19.3	39.4	5.21
Moved into a new place to live	31.1	23.1	38.9	5.47
Changed jobs	34.5	29.5	48.8	4.71

Source: TRANSFORM (2008: 65)

The findings from the TRANSFORM survey suggest that social ties including family and friends, but also interaction more remote acquaintances, play a powerful role in the exchange of ICT skills. A high level of social capital, if defined as existence of extensive networks of

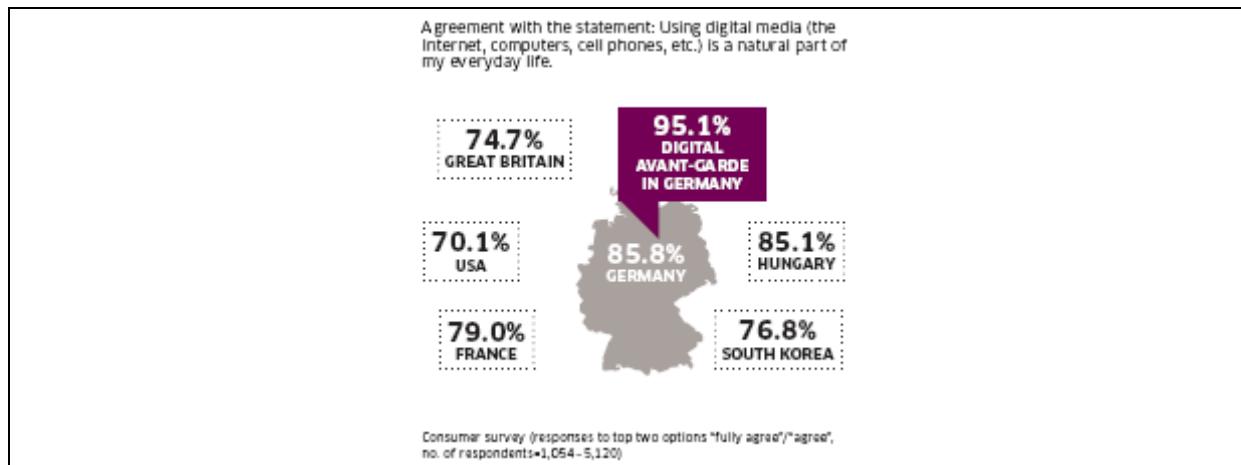
²⁰ Value "1" on 10-point scale (1 = essential, 10 = not important at all)

²¹ Values "1" to "3" on 10-point scale (1 = essential, 10 = not important at all)

strong and weak ties, can therefore be expected to make it easier for a region to spread the skills necessary for making full use of the potential of ICTs.

These findings can hardly surprise given the prominent role which ICTs such as the mobile phone and the Internet play in the lives of large parts of Europe's population. The **LIFE – Digitales Leben** study found that more than three out of four Internet users agree to the statement "I consider using digital media (Internet, computers, mobile telephony etc.) a natural part of my everyday life"²² (see Figure 47).

Figure 47: Perceived role of digital media for everyday life, 2008



Source: Hess et al. (2009: 16)

3.7 Impacts related to entertainment

While, as we have seen, the Internet is increasingly considered the most important source of information for those who use it, its role as a source of entertainment is still less pronounced. Data from the **World Internet Project** show that more people consider television as an important source of entertainment compared to the Internet, newspapers and the radio (Table 44).

Table 44: Perceived importance of the Internet, television, newspapers and radio as sources of entertainment, 2007

	Internet Users Age 18+ Ranking the Media as "Important" or "Very Important"			
	Internet	Television	Newspapers	Radio
Czech Republic	48	66	34	43
Hungary	50	63	36	54
Sweden	41	62	21	33
United States	58	80	31	65

Source: The authors, based on WIP data, 2009

²² "agree fully" or "agree".

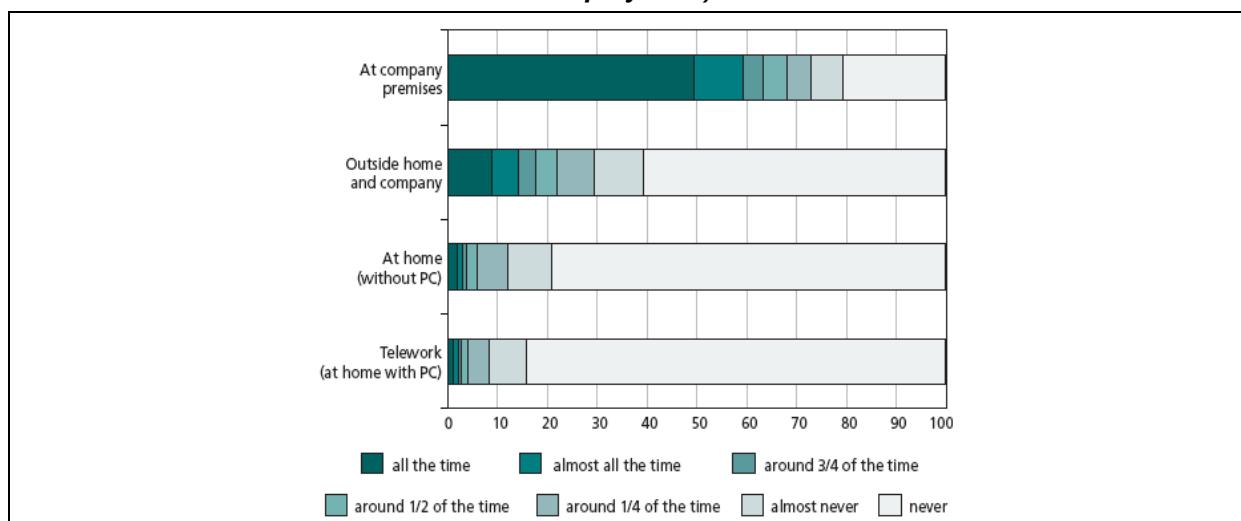
3.8 ICT-based ways of working

One of the most often mentioned ways in which ICTs, including the Internet, mobile computing and mobile telephony, have impacted on the way people work, is by enabling individuals to choose the place where they work much more freely. Forms of work which fully exploit this potential are referred to as telework.

One of the few European countries for which good data on telework exist is the UK. From questions asked in its labour force survey ONS, the **UK National Statistical Institute**, we can deduce that in Spring 2005, 2.1 million people in the country were working mainly from home (or using home as a base) and were only able to do so because they used both a telephone and a computer. Using this definition for telework, the proportion of the workforce who teleworked increased from 3% of the total workforce in 1997 to 7% in 2005 (ONS, 2005).

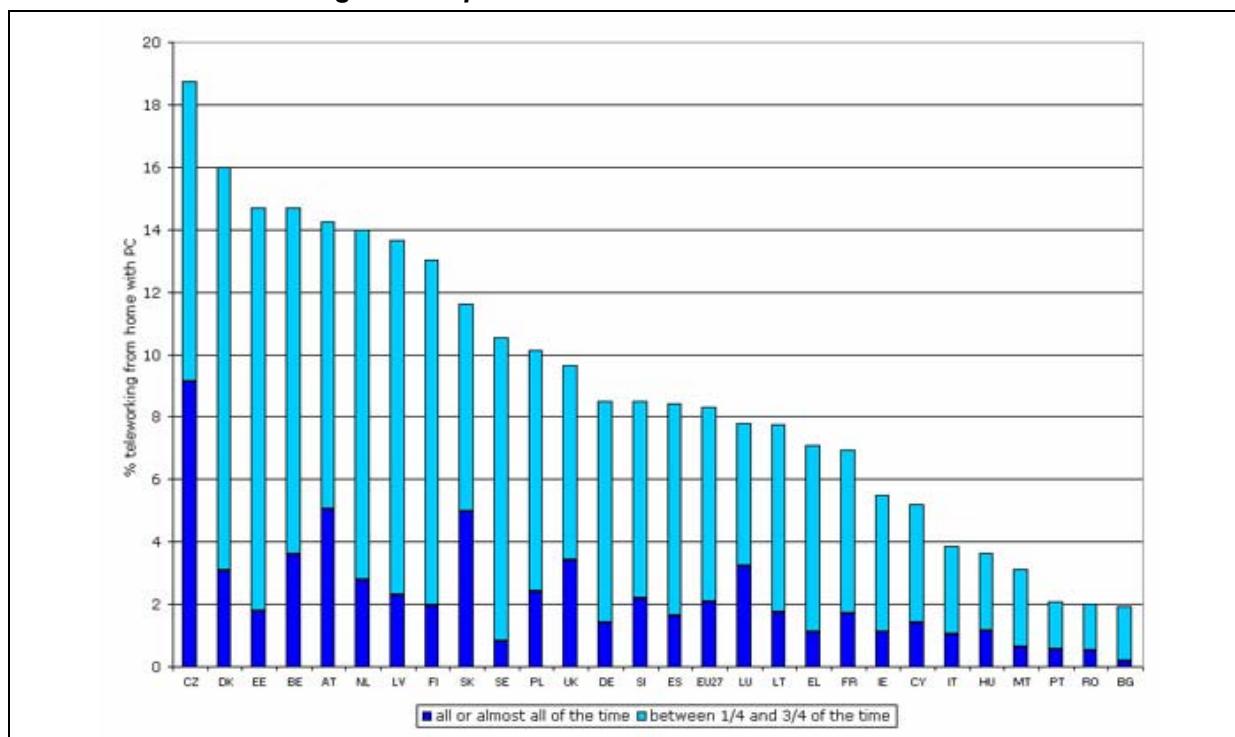
Comparable cross-country data on telework is provided by the **European Survey on Working Conditions** (ESWC), conducted on behalf of the European Foundation for the Improvement of Living and Working Conditions in 2005. Figure 48 presents data for the whole sample (EU27) on the working time spent at different locations. The majority of European workers still spend all or almost all of their working time at company premises. Working locations neither on company premises nor at home, i.e. what may be called "mobile work", are reasonably wide-spread as well. While around 15% of the EU27 workforce report that they spend some working time at home and make use of a PC for doing so (a reasonable definition of telework), the large majority of these do spend only very few hours at home.

Figure 48: Place of work (including homework and telework) in EU27, 2005 (in % of total employment)



Source: European Foundation (Parent-Thirion et al., 2007)

Figure 49 shows country differences in the spread of teleworking at home. The columns only include workers who spend all or almost all (dark blue) or at least one quarter (light blue) of their working time at home. On average, somewhat more than 8 percent of the EU27 workforce met this criterion in 2005, when the ESWC data were collected.

Figure 49: Spread of home-based telework in 2005

Source: European Foundation (Parent-Thirion et al., 2007)

Trends in the spread of telework have most recently been reported again by the **European Foundation for the Improvement of Living and Working Conditions** (2007: 9-10), based on national level data collected by a variable (more or less reliable) sources:

Evidence suggests that the incidence of working away from the place of work and of teleworking is increasing. In percentage terms, workers are more likely to work away from the workplace than they are to telework.

In Austria, the number of teleworkers rose from 21,800 personnel in 1997 to 57,800 in 2000, defined as those who work at least eight hours a week from home on a PC. In Portugal, the incidence of teleworking increased from 0.6% of the working population in 1994 to 2.2% by 1998–1999. In the UK, the proportion of teleworkers (defined as those who work mainly in their own home or mainly in different places using home as a base, who use both a telephone and a computer to carry out their work at home) rose from 4% of the workforce in 1997 to 8% in 2005.

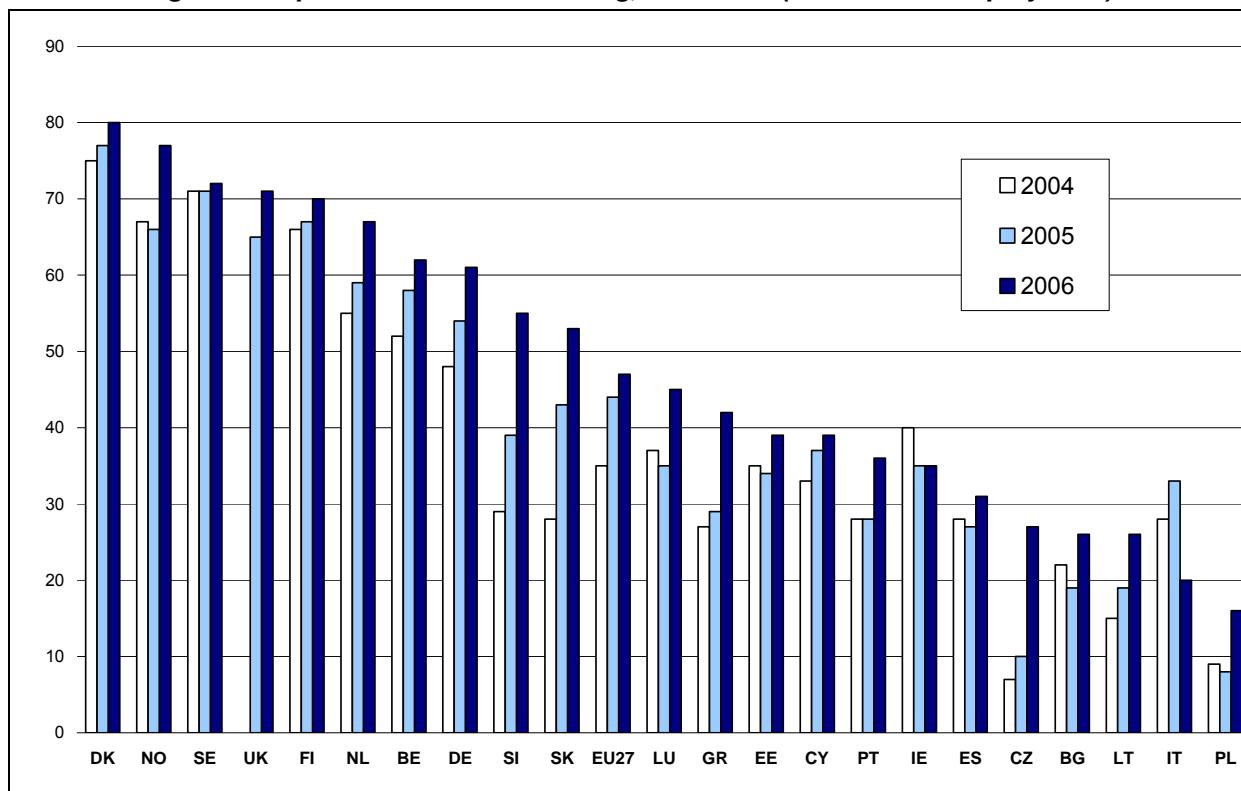
In terms of homeworking, in Denmark, the number of employees working from home increased from 20% to 24% between 2000 and 2005, according to Statistics Denmark (Danmarks Statistik). Likewise, in Finland, the proportion of employees working at home at least occasionally or partly increased from 26% in 1990 to 31% in 1997, remaining at 31% in 2003.

In the new EU Member States, working away from the main workplace has increased over the past decade, following restructuring and the development of the IT and services sectors. This has been the case in Hungary since the early 1990s, with the proportion of people working at premises other than the company premises increasing from 1.3% in 2002 to 2% by 2004. In Poland, although no accurate data are available, the incidence of working away from the workplace is estimated to have increased significantly over the past decade.

In some countries, however, the trend has been downward. In Germany, according to a 2002 study, the percentage of workers working away from the employer's premises declined from 6% in 1993 to 3% in 1997 in western Germany and from 8% to 5% in eastern Germany.

Different figures were produced by the **Community Survey on ICT Usage in Households and by Individuals**. The indicator used measures the percentage of persons employed who work part of their time away from enterprise premises and access their employer's IT system from there. As Figure 50 shows, using this definition (without a lower threshold for the time spent away from company premises), almost one in two workers in the EU are remote e-workers.

Figure 50: Spread of remote e-working, 2004-2006 (in % of total employment)



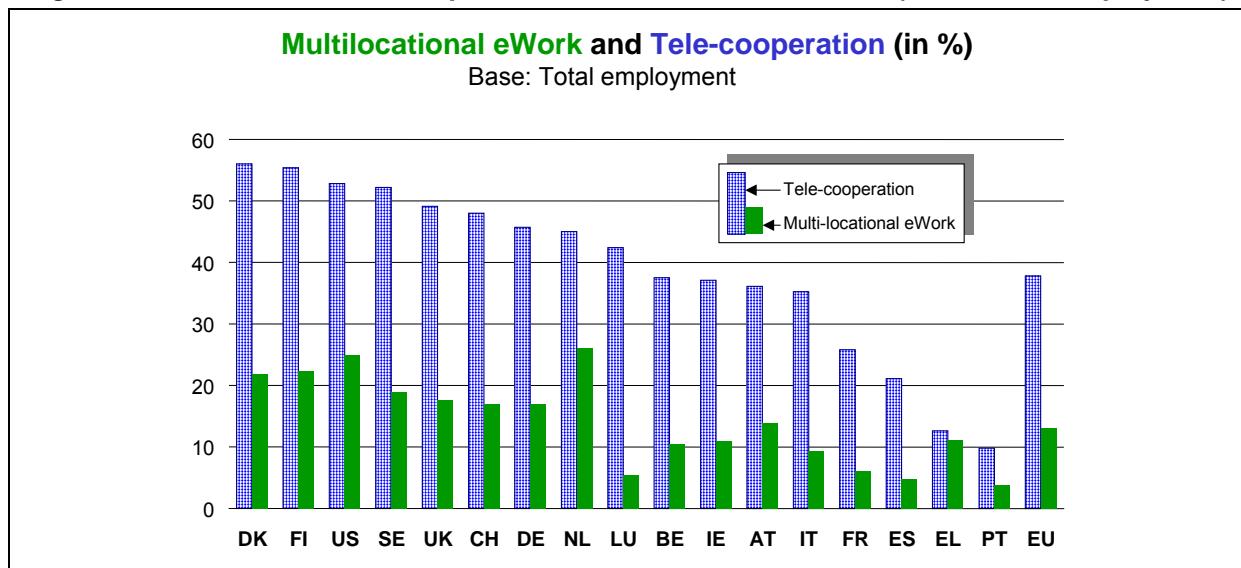
Source: Eurostat database [accessed 2009-03-02, 16:00]

While these approaches open up various possibilities for producing statistics on multi-national, ICT-supported work, it is restricted to remote work in the sense of working taking place "outside the traditional workplace" and remotely from the location of the employer. In contrast, what has been termed tele-cooperation (Gareis & Hüsing 2002) would not (necessarily) be covered by such definitions. Such tele-cooperation is conceptually closely related to telework, which is why it has been dubbed 'in situ telework': Although the majority of white-collar workers today appear to be co-located in central office buildings, in fact they are often working closely together with value chain and project partners at far away locations. Theory suggests that tele-cooperation can boost worker productivity and innovative performance throughout the EU economy by allowing flexible configurations of human capital without actually moving people from one place to the other.

One attempt to collect data on tele-cooperation was undertaken by the **SIBIS** project (Empirica 2002). It was operationalised for survey research as "communicating with external business contacts via e-mail, video-conferencing or electronic data transfer". For further explanation, external persons were described as "customers, clients, suppliers, other business contacts, but also colleagues working at other locations of the same company". Figure 51 makes obvious that the share of workers involved in tele-cooperation (as defined above) is much higher than the share of teleworkers. Obviously, tele-mediated work practices are affecting many more people than only those who actually work from a remote place. It has often been observed that ICTs enable work to be brought to the worker

(telework) instead of transporting workers to work (commuting). But work inputs and outputs are also increasingly transmitted between traditional workplaces via ICTs. This is a process which involves all parts of the economy and, as the SIBIS data show, affected already more than a third of the EU workforce in 2002.

Figure 51: Telework and Tele-cooperation in EU15 Countries in 2002 (in % of total employment)

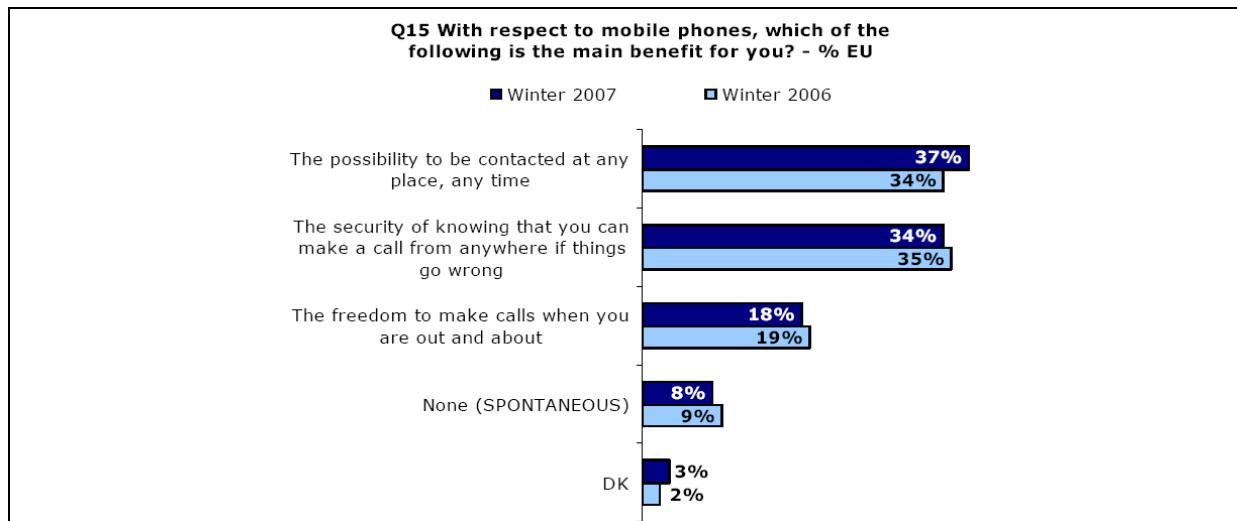


Source: Gareis (2006), based on data from SIBIS 2002/2003

3.9 Impact of mobile telephony

A number of studies have found that mobile telephony is perceived by users as having a number of specific advantages over terrestrial telephony, as well as in comparison to other communication media such as e-mail. According to data from the series of **Special Eurobarometers “E-Communications”**, the advantage which is perceived as being of most importance is the possibility of being reachable at any place and any time (37%). Almost as many EU respondents (33%) chose the security of being able to make a call whenever they are in need of help as the main advantage. 18% opt for the freedom of making calls anytime and anywhere (see Figure 52). Note that, due to the way the question was put, the data are only useful for indicating *which* of the possible benefits is perceived as being the most important. Respondents could only pick one answer, and the option “no advantage” was not included in the reply options.

Figure 53 demonstrates differences by age group with regard to the advantage considered to be most important. Older users tend to give stronger preference to the security factor, while younger people tend to consider the possibility to be contacted wherever they are as most important. This is a pattern which was also found in the data produced by the eUSER project (2005).

Figure 52: Perceived impacts of mobile telephony, 2006-2007, EU25

Source: TNS Opinion & Social (2007: 46), based on Eurobarometer data

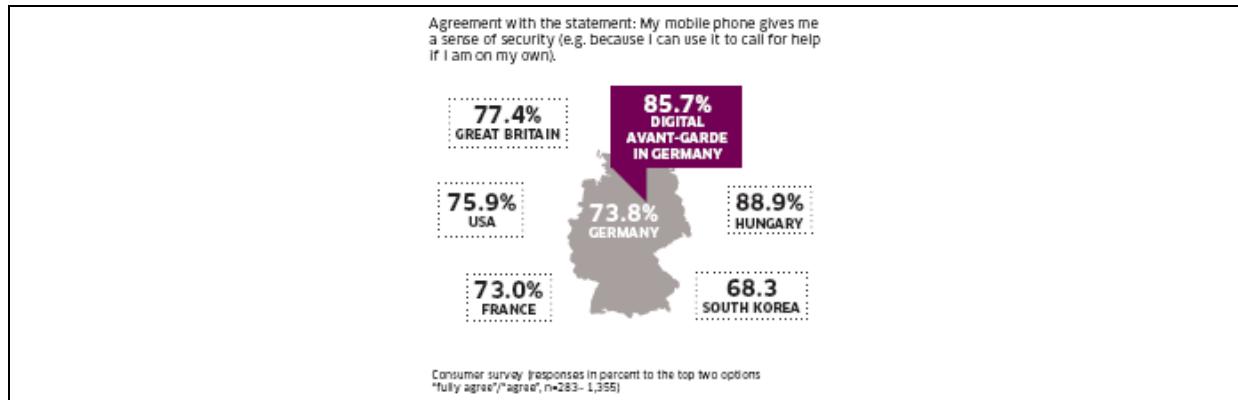
Figure 53: Perceived impacts of mobile telephony by age group, 2007, EU25

QB15 With respect to mobile phones, which of the following is the main benefit for you?						
	The possibility to be contacted at any place, any time	The freedom to make calls when you are out and about	The security of knowing that you can make a call from anywhere if things go wrong	None (SPONT.)	Other (SPONT.)	DK
EU25	37%	18%	34%	8%	-	3%
Age						
15-24	44%	22%	31%	2%	-	1%
25-39	43%	21%	32%	3%	-	1%
40-54	39%	17%	35%	6%	1%	2%
55 +	26%	13%	37%	18%	1%	5%

Source: TNS Opinion & Social (2007: 46), based on Eurobarometer data

There is plenty of evidence which suggests that mobile telephony increases users' sense of security when they are out and about. The **LIFE – Digitales Leben** survey, conducted in December 2009 using a representative sample of Internet users in six countries, found that between 68% (South Korea) and 89% (Hungary) of Internet users agree to the statement "The mobile phone is giving me a feeling of security, e.g. because I can use it to call for help when I am on my own" (Figure 54).

This finding is confirmed by data from other sources, as reported in recent overviews by Katz (2006) and the MobileLife (2006) study.

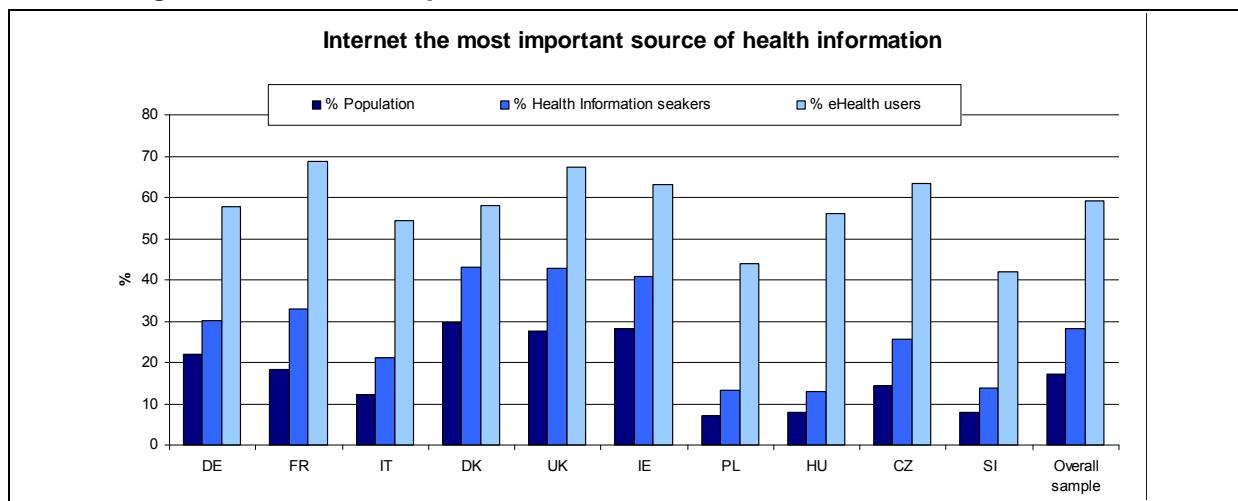
Figure 54: The mobile phone as providing sense of security, 2008

Source: Hess et al. (2009: 46)

3.10 Impacts related to health

For citizens/patients, in Europe the most important current usage of the Internet for health-related purposes is to search for information on health matters of concern for themselves or other members of their families and/or friends. Comprehensive data on the subject, including evidence of impacts, are available from the **eUSER**, **SIBIS** and **BISER** surveys.

According to these surveys, websites providing health information are by far the most widely offered and used eHealth services for the public at present. The **eUSER survey**, for example, found that about one-half of Internet users and about one-in-three of the population in the surveyed countries had searched for health information online (the corresponding figures for the US, in which developments are somewhat more advanced, are even higher with 80% of Internet users). Electronic/online consultation with one's own doctor is much less common (just a few percent report this) although interaction with a web doctor/health professional that they have not met is starting to become more wide-spread.

Figure 55: Perceived importance of the Internet as source of health information

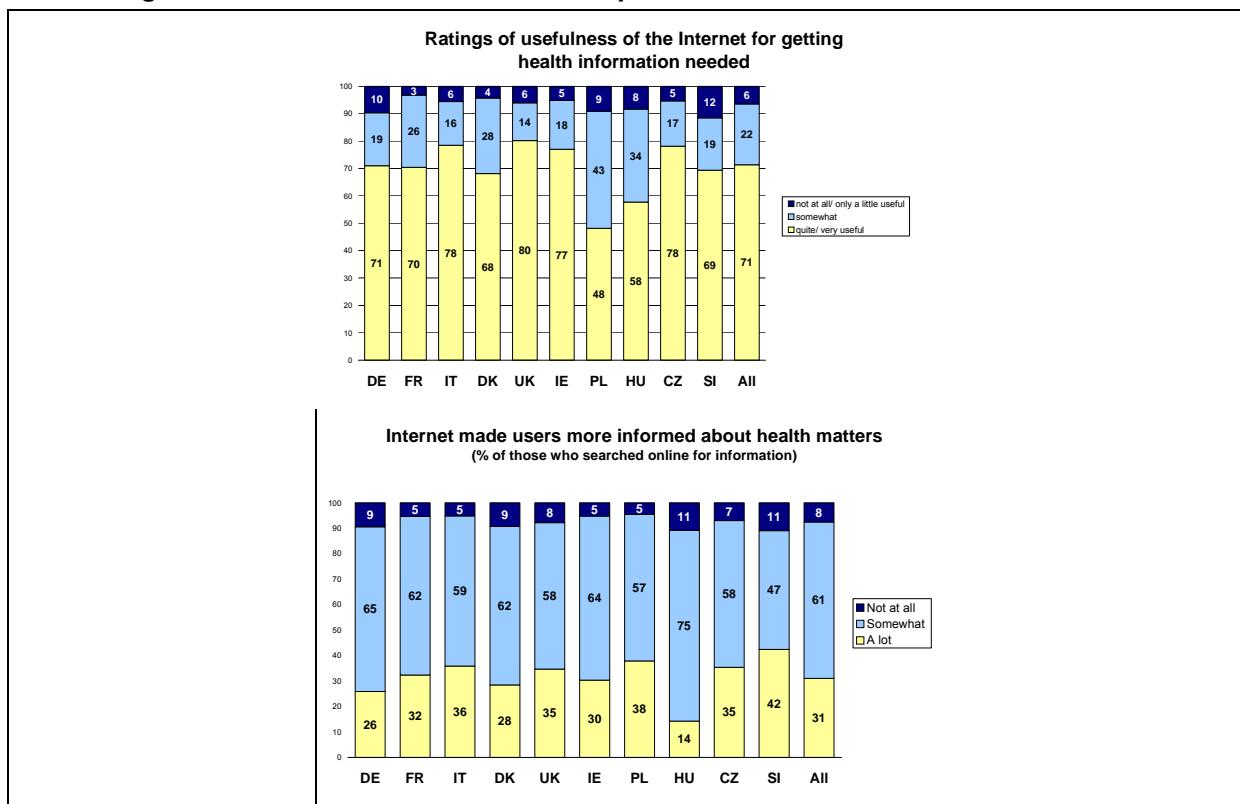
Source: eUSER (2005)

For many it seems that the Internet is becoming the most important source of health information (apart from one's own doctor). The **eUSER** survey found that almost three-in-five (59%) of those who had used the Internet to look for health information said that this was now their most important source of such information, being more important than family medical reference books and other more traditional sources (Figure 55). In all countries covered by the survey, with the exception of Poland and Slovenia, more than one in two of

those who are already availing of online health information consider the Internet the most important source of such information.

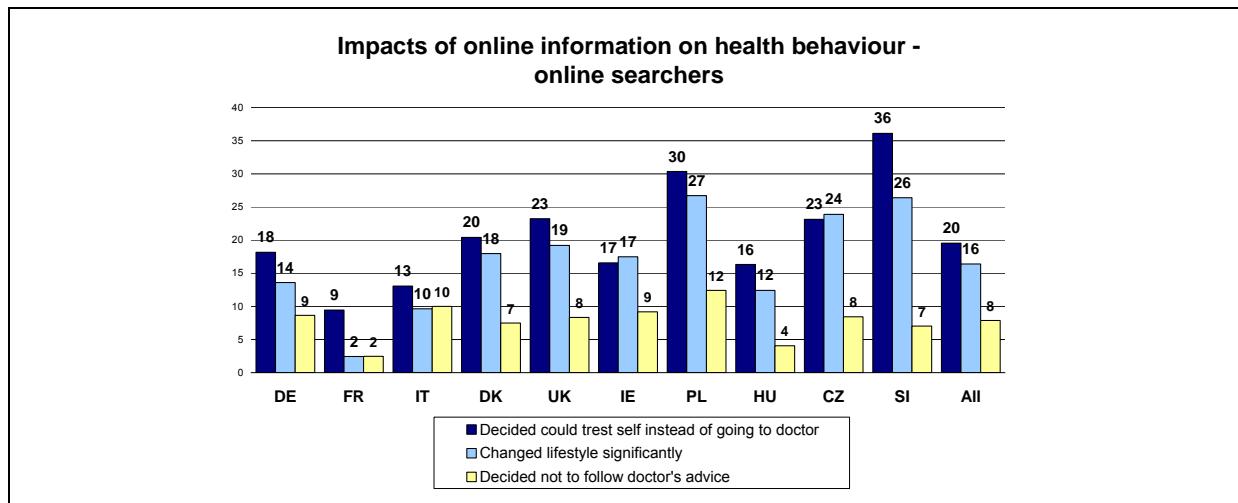
Overall, the eUSER survey found that users of online health services tend to have positive experiences. The majority of respondents found the Internet useful for getting health information that they need and said that the Internet has made them more informed about health matters (see Figure 56).

Figure 56: Perceived usefulness and impact of health information on the Internet



Source: eUSER (2005)

The evidence from eUSER suggests that users quite often take action or make important decisions on the basis of health information that they find on the Internet. One-in-five users of online health information said that they decided they could treat themselves instead of going to a doctor, one-in-six said that they had changed their lifestyle significantly and one-in-twelve decided not to follow their doctor's advice (see Figure 57).

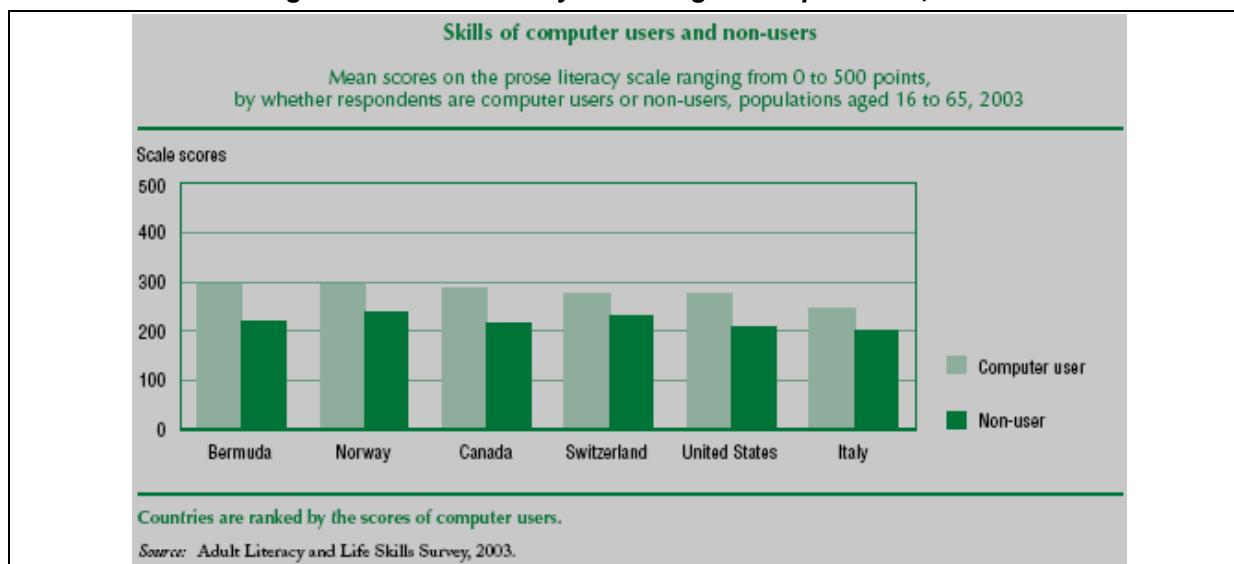
Figure 57: Perceived impact of online health information on health behaviour

Source: eUSER (2005)

3.11 Impacts related to education and lifelong learning

Analysis of data from the 2003 **PISA surveys** (OECD, 2005) suggests that the mathematics performance of students without access to computers at home was significantly below that of those with home access to computers (cf. OECD, 2008a: 22). This difference was found to be significant for all countries covered by the study. In 23 out of the 31 countries in the study, a performance advantage (albeit a lower one) persisted even after accounting for different socioeconomic backgrounds of students. The performance difference associated with school access to computers is less pronounced, although it is high in the United States, Canada and the Czech Republic. Additional findings suggest that students with shorter experience in using computers and those who use them least at home scored below average in mathematics. The highest performances in both mathematics and reading tended to be from students with a medium level of computer use. The authors conclude from the last finding that excessive computer use could have a negative impact on school performance.

Only six countries participated in the international 2003 **Adult Literacy and Life Skills Survey** (ALL), which was managed by Statistics Canada. Comparison between computer users and non-computer users shows, again, that the former are likely to perform better, e.g. on the prose literacy scale (see Figure 58).

Figure 58: Prose literacy according to computer use, 2003

Source: Statistics Canada & OECD (2005: 185)

The questionnaire applied for the ALL survey contained a number of items on perceived usefulness and attitude toward computers, worded as following: "Please tell me whether you strongly agree, agree, disagree, or strongly disagree with each of the following statements:

- Computers have made it possible for me to get more done in less time;
- Computers have made it easier for me to get useful information;
- Computers have helped me to learn new skills other than computer skills;
- Computers have helped me to communicate with people;
- Computers have helped me reach my occupational (career) goals"

Table 45 shows results for Canada, which are similar to those found in the remaining countries covered by the survey.

Table 45: Perceived impacts of computer use, Canada only, 2003

	Age group					Ratio youngest age group: oldest
	16 to 25	26 to 35	36 to 45	46 to 55	56 to 65	
% of computer users who agree with the statement						
Computers have made it easier for me to get useful information	93.6	91.5	88.2	86.8	78.5	1.2
My level of computer skills meets my present needs	91.2	83.9	76.4	72.5	73.0	1.2
Computers have helped me to communicate with people	82.2	79.0	72.5	71.5	62.7	1.3
Computers have made it possible for me to get more done in less time	80.4	74.8	66.9	64.5	57.3	1.4
Computers have helped me learn new skills other than computer skills	72.2	69.5	60.7	56.3	45.2	1.6
I feel comfortable installing or upgrading computer software	59.0	59.0	44.8	36.6	31.8	1.9
Computers have helped me reach my occupational (career) goals	45.3	54.9	46.5	43.0	33.2	1.4

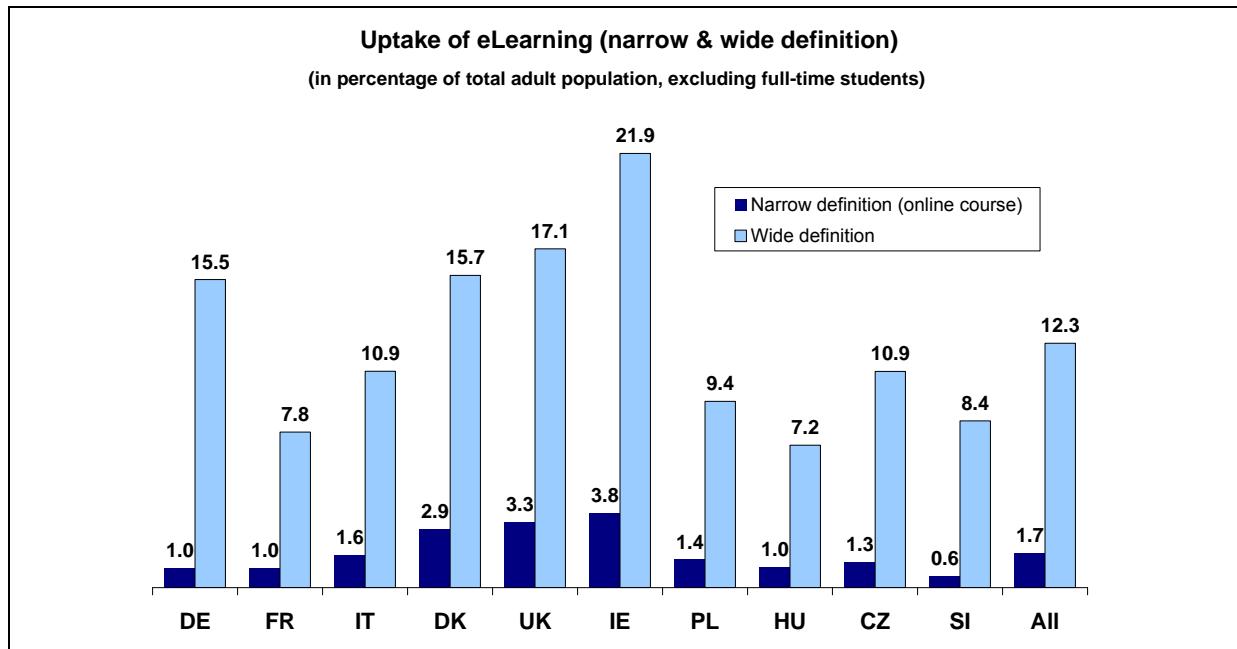
Source: Statistics Canada, Adult Literacy and Life Skills Survey, 2003.

Source: Veenhof et al. (2005: 22)

The 2005 eUSER survey demonstrated that eLearning is not widespread in Europe yet, if eLearners are defined as those who have taken an online training course in the 12 months

prior to the survey ("narrow definition", see Figure 59). However, using a wider definition, which includes all those who are using the Internet in the context of purposeful learning activities, the spread of eLearning had reached a significant share of the adult population in 2005 already.

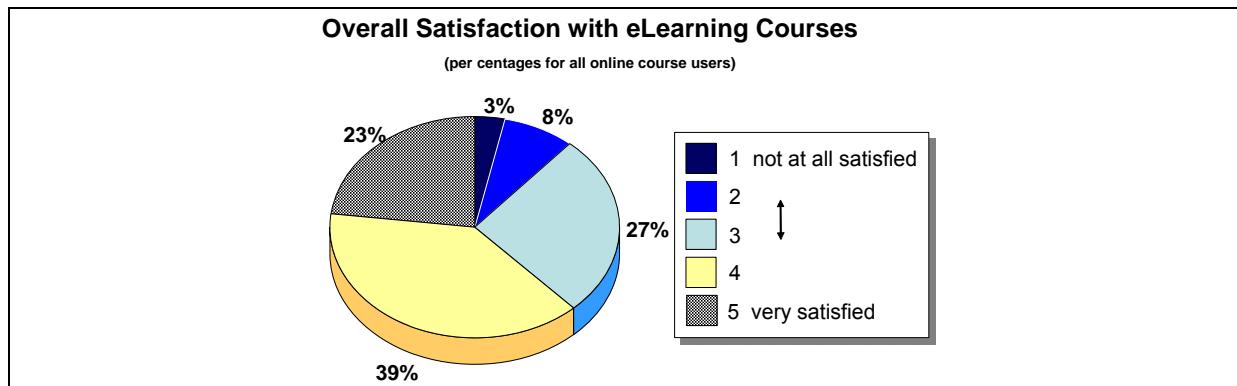
Figure 59: Uptake of eLearning (narrow and wide definition) – by country, 2005 (in %)



Source: eUSER (2005b)

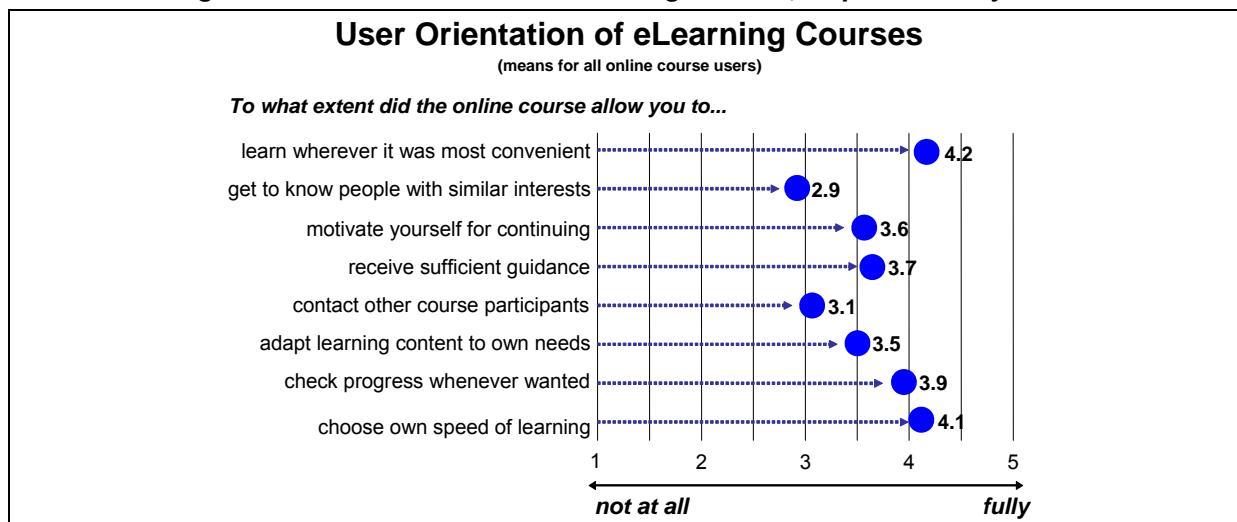
The eUSER survey also produced tentative evidence that online learning is indeed enabling more citizens to take part in lifelong learning. This is a result of the flexibility eLearning offers for adapting learning supply modes to the individual demands of the user. *About one in four individuals who engage in an eLearning course would have been unlikely to engage in lifelong learning if it had not been possible for them to do this online.* This means that once (and if) online learning diffuses more widely among the EU population, eLearning is likely to contribute significantly to further growth of lifelong learning practice.

The data from the eUSER survey show that a large majority of those who have taken an online eLearning course are satisfied with what they got from the service(s) they used (Figure 60). They overwhelmingly report good usability and user orientation of their online courses when asked about aspects such as: ability to learn at whatever place they found most convenient; ability to choose own speed of learning; possibility to check learning progress whenever wanted; ease of interface use; comprehensibility; and extent to which content is well organised.

Figure 60: Overall satisfaction with eLearning courses among users

Source: eUSER (2005)

Factors which are rated, on average, as least satisfactory are possibilities for personal interaction with co-learners and teachers/tutors and capability of the eLearning service to motivate for continuing with the course (Figure 61).

Figure 61: User orientation of eLearning courses, as perceived by users

Source: eUSER (2005)

The data provides some evidence that the social aspect of learning is diminished when it is done mainly online – even if most existing online courses appear to include elements of “blended learning”. Where being practised, blended solutions seem not always to work well in terms of providing both a sufficient social dimension and the benefits of the eLearning aspects. This appears to be a major barrier to take-up, as the majority of would-be lifelong learners consider the social side of learning-related activities as important: more than two out of three respondents state that the possibility to get to know people is a major advantage of learning activities. This applies to the same extent across all ages and levels of educational attainment.

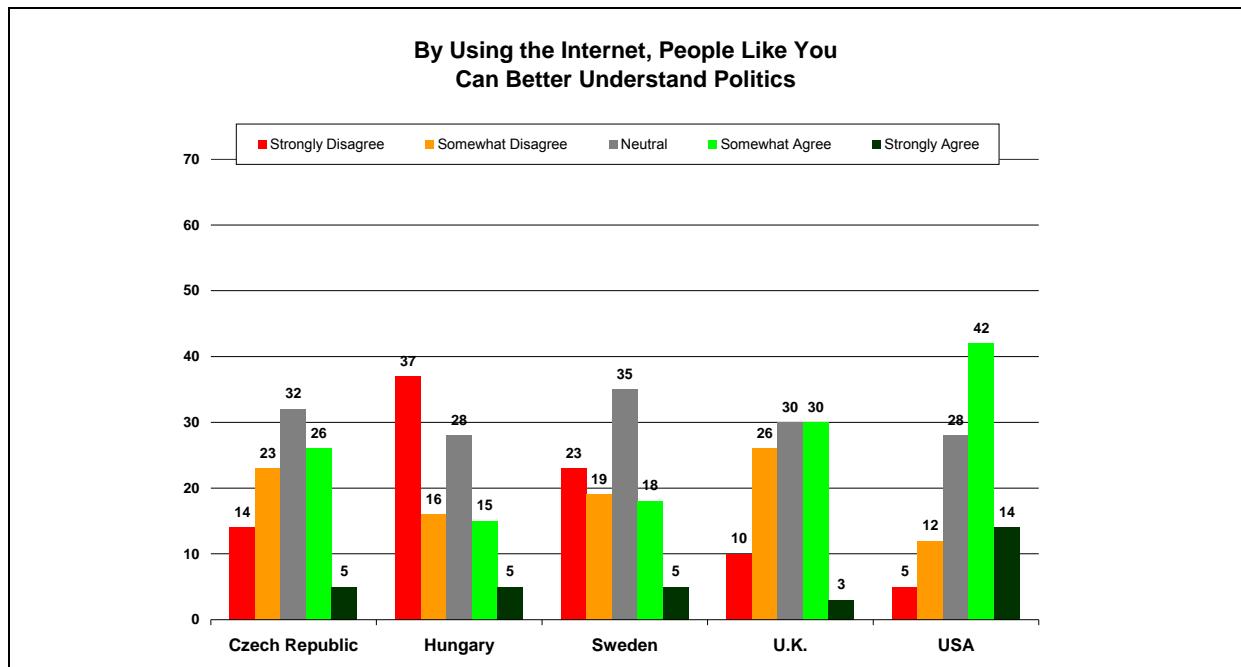
3.12 Impacts on political participation and local living conditions

Among the possible social impacts of the Internet and ICTs, positive effects on people's likelihood to participate in the political process have been hardest to find (cf. Katz & Rice,

2002). The latest statistical data, while providing new insights, still leave many questions open.

2007 data from the **World Internet Project** show large differences between countries when it comes to the perceived effect of the Internet on respondents' attitudes and experiences with the political process. As can be seen in Figure 62, the share of Internet users who perceive a positive impact²³ of the Internet on their ability to understand politics varies between 56% in the USA and 20% in Hungary. In both Hungary and Sweden, people are much more likely to disagree than to agree with the statement that the Internet increases people's understanding about politics.

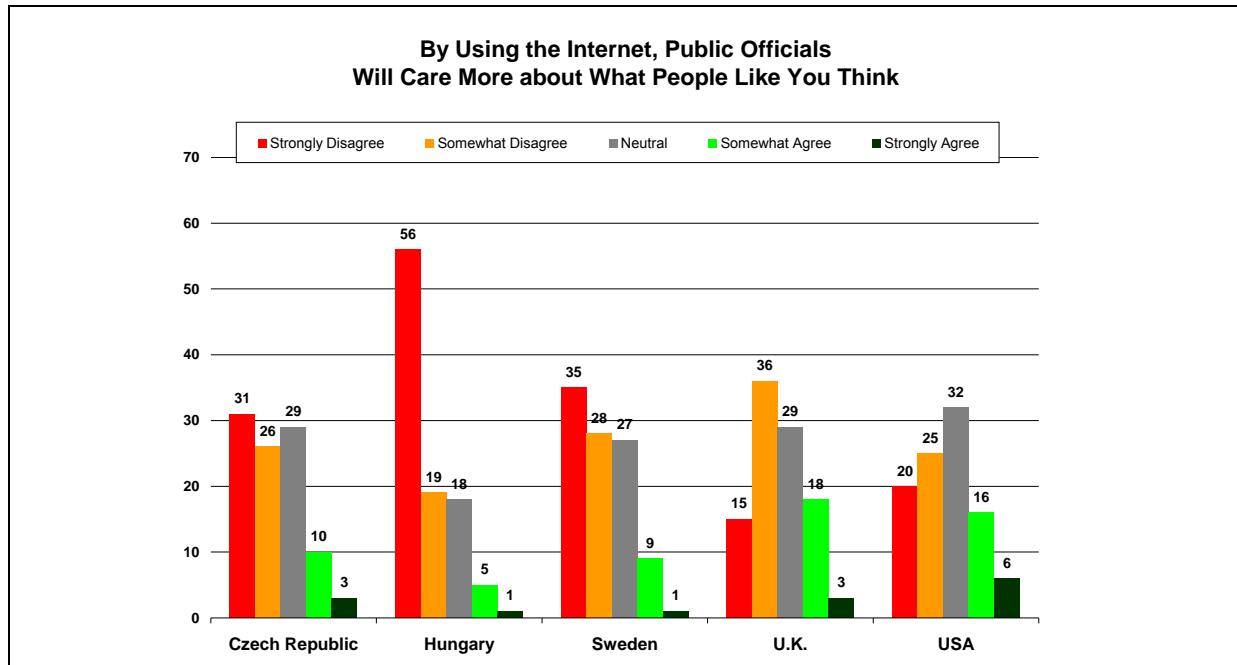
Figure 62: Perceived effect of Internet use on ability to understand politics, 2007



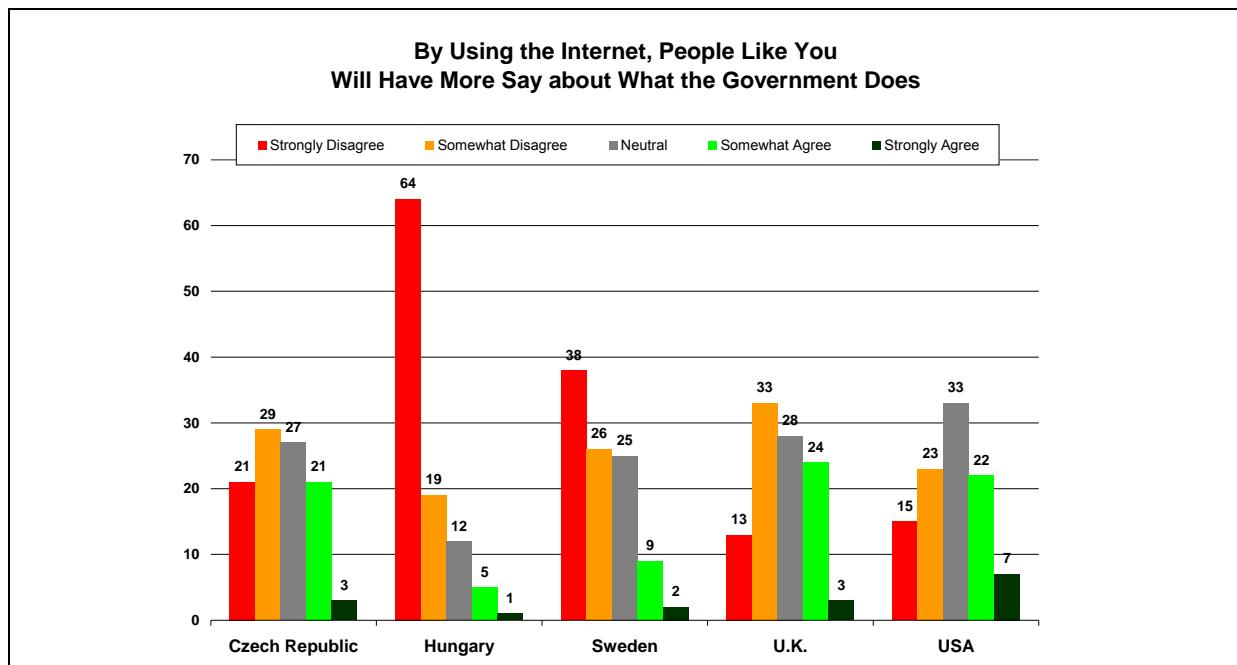
Source: The authors, based on WIP data, 2009

There is even more wide-spread scepticism with regard to the Internet's effect on the behaviour of politicians and public officials. While many scholars have suggested that the Information Society will make politicians more responsive to the needs and preferences of citizens, in all countries except for the USA more than half of all Internet users "strongly disagree" or "somewhat disagree" with the statement that the Internet "will make public officials care more about what people like you think" (Figure 63). A mere 6% (Hungary) to 22% (USA) agree to the statement ("strongly" or "somewhat").

²³ Replies "strongly agree" and "somewhat agree"

Figure 63: Perceived effect of Internet use on public officials' attitudes, 2007

Source: The authors, based on WIP data, 2009

Figure 64: Perceived effect of Internet use on one's influence on government behaviour, 2007

Source: The authors, based on WIP data, 2009

Results to a question about the perceived effect of the Internet on the degree to which people have a say about what the government does (Figure 64) are in line with the previous ones. Again, a large share of Internet appear to be careful if not cynical about the extent to which they will be able to exert an influence on politics in spite of ICT's potential to enable a more transparent and inclusive policy-making process.

The **TRANSFORM** (2008) survey attempted to gauge whether applications of the Internet are perceived as having had a positive effect on living conditions within regions already. For this purpose a list of seven aspect of regional living conditions was applied::

- (a) Conditions for finding a good job,
- (b) Conditions for getting high-quality education,
- (c) Conditions for engaging in adult/further education and lifelong learning,
- (d) Conditions for setting up an own business,
- (e) Conditions for making your voice heard in regional politics and public life,
- (f) Conditions for enjoying leisure time,
- (g) Conditions for enjoying a high quality of life;

The question wording was as follows: "Some people think that the Internet has an influence on the living and working conditions in Europe's regions, others think that this is not the case. In the past three years, what kind of influence would you say the Internet has had on the general conditions in your region regarding ... [item]". Table 46 reports the findings.

**Table 46: Perceived effect of the Internet on living conditions in own region
(Very positive or positive effect²⁴ in % of total sample per region)**

		Finding a good job	Getting good education	Engaging in lifelong learning	Setting up an own business ²⁵	Making one's voice heard in local politics & public life	Enjoying leisure time	Enjoying quality of life
Schleswig-Holstein	DE	52.9	48.2	50.7	42.3	30.7	58.9	45.8
Thüringen	DE	47.2	42.8	39.7	44.1	29.2	60.0	42.8
Emilia-Romagna	IT	59.4	65.2	62.7	54.2	48.1	70.7	49.1
Malopolskie	PL	74.6	85.6	67.5	61.8	44.5	81.4	63.4
Pomorskie	PL	75.0	78.4	69.3	59.0	48.9	79.2	66.5
Bratislavsky Kraj	SK	86.9	80.4	76.2	77.4	56.0	84.0	66.4
Vychodne Slovensko	SK	64.2	70.4	58.2	54.7	38.6	68.3	46.7
Navarra	ES	49.3	52.1	44.2	43.4	36.8	67.0	50.2
Extremadura	ES	44.8	48.2	45.7	46.4	40.8	61.9	47.8
Mellersta Norrland	SE	57.3	58.9	57.5	56.6	50.6	52.7	51.4
South Yorkshire	UK	48.0	51.1	49.1	49.5	27.5	51.5	38.3
East Anglia	UK	50.9	52.5	51.0	52.8	28.7	61.0	49.0
Total sample		58.1	60.1	55.0	53.4	39.5	65.9	51.0

Data source: TRANSFORM 12 Region Internet User Survey

As the table shows, positive effects are reported most often for the areas "enjoying leisure time" (66%), getting good education (60%), finding a good job (58%) and engaging in lifelong learning (55%). More than one in two also report positive impacts on conditions for setting up an own business (53%) and enjoying quality of life (51%). While much has been made of the Internet's potential to improve direct participation of citizens in day-to-day policy-making and in civil society, the results from the survey indicate that it is proving difficult to translate such potential into reality. Still, 39% report that the Internet has made it easier to make their voice heard in local/regional politics and public life.

²⁴ Values "1" and "2" on 5-point-scale from "very positive" to "very negative"

²⁵ Only respondents who have made some first-hand experience with self-employment

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4 Annex A: Available Data Sources for International Comparisons

Name of data source	Description (incl. target, survey unit)	Responsible	Country coverage	Frequency
ARD/ZDF Online Studie	GPS. 2008: 1,802 individuals. Probability sample. Topics: Use of the Internet. http://www.ard-zdf-onlinestudie.de/	ARD / ZDF Broad-casting stations	DE	Annually
ALL – International Adult Literacy and Life Skills Survey	GPS (people aged between 16 and 65); pilot in 2001, first survey in 2003, survey in a second group of countries 2005. http://nces.ed.gov/Surveys/ALL/	Statistics Canada, OECD	CD, USA, CH, N, NL, BE, IT, China, others	2003, 2005
BISER – Benchmarking the Information Society: eEurope Indicators for European Regions	General Population Survey: Target: total population aged 15+; total sample size: 11,369. Business survey: Target: all establishments 5+ employees; total sample size: 8,579. Representative samples in 28 NUTS II regions across the EU. http://www.biser-eu.com/	BISER consortium led by empirica.	28 NUTS II regions across EU (excl. LUX)	2003 (one-off)
CLFS – Community Labour Force Survey	Households. http://circa.europa.eu/irc/dsis/employment/info/data/eu_lfs/index.htm	Eurostat with NSIs	EU25	annual (quart. since 1999)
Community survey on ICT usage in households and by individuals	GPS, ca. 185,000 individuals, random sample. Topics: Use of the Internet and mobile phones. http://epp.eurostat.ec.europa.eu	Eurostat, NSIs	EU	annually since 2002
EB – Eurobarometer Flash 88, 97, 103112, 125, 135 “Internet and the Public at Large”	GPS (~30 000 in EU15 + Norway, Iceland). http://ec.europa.eu/public_opinion/archives/flash_arch.htm	CEC/ Gallup Europe	EU15	10/2000 - 11/2002 (discontinued)
EB – Special Eurobarometer 274, 293 “E-Communications”	Special EB 293: 26,730 EU citizens in 27 Member States. CAPI (face-to-face). Topics: Telecommunication products. http://ec.europa.eu/public_opinion/archives/eb_special_en.htm	CEC/ TNS Europe	EU27	2006, 2007
ECHP – European Community Household Panel	60,000 European households. http://circa.europa.eu/irc/dsis/echpanel/info/data/information.html	Eurostat with NSIs	EU	The total duration of the ECHP was 8 years, running from 1994 to 2001

Name of data source	Description (incl. target, survey unit)	Responsible	Country coverage	Frequency
eLiving – Life in a Digital Europe	Target: 1750 individuals in each country Wave 2: 66-83% of the 1750 individuals per country where re-interviewed. http://www.eurescom.de/e-living/	e-Living Consortium	NO, DE, IS, IT, BG, UK	Wave 1: 2001 Wave 2: 2002
EQLS – European Quality of Life Survey	Target: Individuals in private households Sample: 26,000 (face-to-face interviews). http://www.eurofound.europa.eu/areas/qualityoflife/eqls/2007/index.htm	European Foundation for the Improvement of Living and Working Conditions	EU25 + IS, NO, CH	2003, 2007
ESWC – European Survey on Working Conditions (prev.: ESWE)	GPS (aged 16 to 64), N = ~21,000 (in 2000, excluding NMS). http://www.eurofound.europa.eu/ewco/surveys/ewcs2005/index.htm	European Foundation for the Improvement of Living and Working Conditions	EU27 (since 2000/2002)	1990, 1995, 2000/2002, 2005
ETUS – Harmonised European Time Use Survey (TUS)	GPS. https://www.testh2.scb.se/tus/tus/doc/KS-CC-04-007-EN.pdf	Eurostat, NSIs	EU	2001 (1 st)
eUSER – Evidence-based support for the design and delivery of user-centred online public services.	GPS, n=1000 per country (IE: n=800), random sample. Topics: online public services (eGovernment, eHealth, eLearning). http://www.euser-eu.org	eUSER consortium	CZ, DE, DK, FR, HU, IE, IT, PL, SI, UK	2005
IALS – International Adult Literacy Survey	GPS (2000 to 8000 adults aged 16-65 per country) http://www.statcan.gc.ca/dli-ild/data-donnees/ftp/ials-eiaa-eng.htm	OECD, Statistics Canada, others	1994: CD, DE, IE, NL, PL, SE, CH (part), US. 1996: AU, BE, IE, UK, Z. 1998: CR, DK, FI, HU, IT, NO, SI, CH (rest).	1994, 1996, 1998
ISSP – International Social Survey Programme	Target: approximately 1000 individuals per country http://www.issp.org/	various national social research institutes	various	1989, 1997, 2005
LIFE – Digitales Leben (Digital Life)	Target: 10,545 Internet users in six countries (random sample): n=~5000 in Germany, other countries: n=~1000 each. Topics: Effects of ICT use on everyday life http://www.studie-life.de/	Institut für Wirtschaftsinformatik und Neue Medien der Ludwig-Maximilians-Universität München	DE, HU, FR, UK, South Korea, USA	one-off (2008)

Name of data source	Description (incl. target, survey unit)	Responsible	Country coverage	Frequency
OFCOM: The International Communications Market 2006	Target: 400 adults aged 18-65 (China and Japan 18-85) per country. http://www.ofcom.org.uk/research/cm/icmr06/	Synovate/Ofcom	UK, FR, DE, IT, US, JP, CN	2006
OxIS – Oxford Internet Surveys	2007: n=2,350 individuals aged 14+ (77% response rate). Topics: digital and social inclusion and exclusion; regulation and governance of the Internet; privacy, trust and risk concerns; uses of the Internet, including social networking, entertainment and online education. http://www.ox.ac.uk/microsites/oxis/	Oxford Internet Institute	UK	2003, 2005, 2007
STILE Pilot Survey on Telework	Target: Multi-locational eWorkers Sample: non-random, n=718 Topics: Testing of pilot module on eWork for inclusion in CLFS http://www.stile.be/	STILE consortium	BE, HU, IT, UK	2002 (one-off)
TRANSFORM 12 Region Survey	Target: Regular Internet users Sample: 12 selected NUTS2 regions across 7 EU countries; random sample. Topics: Advanced, “transformative” uses of the Internet and mobile applications. http://www.transform-eu.org	TRANSFORM consortium	DE, ES, IT, PL, SE, SK, UK	2008 (one-off)
Eurostat Urban Audit database	Data on 321 EU cities and surrounding regions + 36 cities from NO, CH, TR. http://www.urbanaudit.org/	NSIs, RSIs, cities	EU 27 + NO, CH, TR	2003, 2007
WIP – World Internet Survey Project	Target: Adult individuals. Sample: 500-3000 per country, random samples. Topics: Uptake of the Internet, uses, perceptions, barriers, impacts. http://www.worldinternetproject.net/	World Internet Project consortium	Australia, Canada, China, Columbia, CZ, HU, Israel, Macao, New Zealand, Singapore, SE, UK, USA.	2007

5 Annex B: Questionnaire Flash Eurobarometer 241

FL 241 --FINAL

BACKGROUND VARIABLES

D1. Gender [DO NOT ASK - MARK APPROPRIATE]

- [1] Male
- [2] Female

D2. How old are you?

- years old
- [00] [REFUSAL/NO ANSWER]

D3. How old were you when you stopped full-time education?

[Write in THE AGE WHEN EDUCATION WAS TERMINATED]

- years old
- [00] [STILL IN FULL TIME EDUCATION]
- [01] [NEVER BEEN IN FULL TIME EDUCATION]
- [99] [REFUSAL/NO ANSWER]

D4. As far as your current occupation is concerned, would you say you are self-employed, an employee, a manual worker or would you say that you are without a professional activity? Does it mean that you are a(n)...

[IF A RESPONSE TO THE MAIN CATEGORY IS GIVEN, READ OUT THE RESPECTIVE SUB-CATEGORIES - ONE ANSWER ONLY]

- **Self-employed**

- i.e. : - farmer, forester, fisherman 11
- owner of a shop, craftsman 12
- professional (lawyer, medical practitioner, accountant, architect,...) 13
- manager of a company 14
- other 15

- **Employee**

- i.e. : - professional (employed doctor, lawyer, accountant, architect) 21
- general management, director or top management 22
- middle management 23
- Civil servant 24
- office clerk 25
- other employee (salesman, nurse, etc...) 26
- other 27

- **Manual worker**

- i.e. : - supervisor / foreman (team manager, etc...) 31
- Manual worker 32
- unskilled manual worker 33
- other 34

- **Without a professional activity**

- i.e. : - looking after the home 41
- student (full time) 42
- retired 43
- seeking a job 44
- other 45

- [Refusal] 99

D6. Would you say you live in a ...?

- large city 1
- other town/urban centre 2
- rural zone 3
- [Refusal] 9

D7. Which of the following best describes your household composition?

(READ OUT - ONE ANSWER ONLY)

Which of the following best describes your household composition? (READ OUT - ONE ANSWER ONLY)

- 1- Single person household
- 2- Married or cohabiting couple, having no children
- 3- Married or cohabiting couple, no children living at home
- 4- Single parent, one or more children living at home
- 5- Married or cohabiting couple, with one or more children living at home
- 6- Other
- 9- [DK/NA]

Q1. I'm going to read out a list of leisure activities. How often would you say that you do the following?

(READ OUT – ONE ANSWER PER LINE):

Everyday or almost every day	5
At least once a week	4
At least once a month	3
Several times a year	2
Less than twice a year or never	1
[Don't know/No answer]	9
A. sport, fitness and exercise	1 2 3 4 5 9
B. go to the cinema, a concert, theatre or other life performance, or watch live sport events	1 2 3 4 5 9
C. watch TV	1 2 3 4 5 9
D. have a meal in a restaurant, café or pub, or go for a drink at a bar or club	1 2 3 4 5 9
E. pursue a hobby	1 2 3 4 5 9
F. keep yourself informed (e.g. via newspapers, Internet, etc.)	1 2 3 4 5 9
G. meet friends	1 2 3 4 5 9

Q2. How often you do you actively participate in the activities of organizations, like sports clubs, religious or voluntary aid organizations, trade unions, campaign organisations etc.?

(READ OUT – ONE ANSWER ONLY):

At least once a week	3
Less than once a week	2
Never	1
[DK/NA]	9

Q3. Generally speaking, would you say that you can't be too careful in dealing with people, or that most people can be trusted? Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted. Of course, you can use any number in between to express your opinion.

number from 0 to 10
 [9] [DK/NA]

Q4. In the last 3 months, how often have you used the Internet – whether at home, at work, or somewhere else – for your personal use?

(READ OUT – ONE ANSWER ONLY):

Several times a day	6
About once a day	5
At least once a week	4
At least once a month	3
Less than once a month	2
Almost Never / never	1 (go to Q7)
[No access to the Internet – DO NOT READ OUT]	7 (go to Q7)
[DK/NA]	9 (go to Q7)

ASK IF any answer is Q4= 6, 5, 4, 3, and 2

Q5. Which of the following Internet-related activities have you already carried out?

(READ OUT – ONE ANSWER PER LINE):

Yes	1
No	2
[DK/NA]	9

A. Sending / receiving e-mail or instant messages	1 2 9
B. Buying products and /or services through the internet	1 2 9
C. Internet Banking	1 2 9
D. Playing or downloading games, images, films, music or software	1 2 9
E. Filling and sending forms electronically to the public administrations	1 2 9
F. Doing an online course or using the internet with the purpose of learning	1 2 9
G. Creating a profile or sending a message in a social networking website	1 2 9
H. Using a search engine to look for information	1 2 9
I. Reading, listening or watching the news on the internet	1 2 9
J. Upload photos, videos or other files to a website where others can see	1 2 9
K. Using the internet for my daily work	1 2 9
L. Transferring content from the internet to other devices (mp3, game console....)	1 2 9

ASK IF any answer is Q4= 6, 5, 4, 3, and 2

Q6. Based on your personal experience, to what extent do you agree with the following statements about the Internet: do you strongly agree, rather agree, rather disagree or strongly disagree that the Internet has improved:

(READ OUT – ROTATE - ONE ANSWER PER LINE):

Strongly agree	4
Rather agree	3
Rather disagree	2
Strongly disagree	1
[DK/NA]	9

A. Your opportunity to meet new people	1	2	3	4	9
B. The way you manage your finances	1	2	3	4	9
C. The way you deal with public authorities	1	2	3	4	9
D. The way you get health-related information	1	2	3	4	9
E. The way you perform your job	1	2	3	4	9
F. The way you shop	1	2	3	4	9
G. Your opportunity to learn	1	2	3	4	9
H. The way you pursue your hobbies	1	2	3	4	9
I. Your capability to be informed about current issues	1	2	3	4	9
J. Your relationships with family members and friends	1	2	3	4	9
K. Your opportunity to share views/access culture	1	2	3	4	9

ASK ALL

Q7. To what extent do you agree or disagree that people that don't use the Internet:

(READ OUT – ROTATE - ONE ANSWER PER LINE):

Strongly agree	4
Rather agree	3
Rather disagree	2
Strongly disagree	1
[DK/NA]	9

A. Miss the opportunity of greater contact with friends and family	1	2	3	4	9
B. Are at a disadvantage in their career prospects	1	2	3	4	9
C. Risk becoming old-fashioned	1	2	3	4	9
D. Miss the opportunity of finding good bargains online (including airline tickets and trips)	1	2	3	4	9
E. Are less open to the outside world	1	2	3	4	9
F. Know less and are not as well informed as other people	1	2	3	4	9
G. Have more time for themselves, family and friends	1	2	3	4	9
H. Take less risk because they don't get exposed to the risk of online fraud	1	2	3	4	9
I. Take less risk because they don't run the risk of other people finding out information about them	1	2	3	4	9
J. Are less reachable for professional purposes	1	2	3	4	9
K. Avoid the frustration of dealing with complicated technologies	1	2	3	4	9

ASK IF any answer is Q4= 1, 7 or 9

Q8. In the past year, have you asked someone else (a friend, a colleague, a neighbour, some in your family) to send an email for you, get information from the Internet or make an online purchase?

Yes	1
No	2
[DK/NA]	9

ASK ALL

Q9. Do you use a mobile phone?

(READ OUT – ONE ANSWER ONLY):

Several times a day	4
At least once every day	3
Not every day, but at least once per week	2
Only occasionally (less than once per week)	1
I don't have one	7 (go to Q11)
[DK/NA]	9 (go to Q11)

Ask if QU9= 1, 2, 3, 4

Q10. Based on your personal experience to what extent do you agree or disagree with the following statements about the use of mobile phones? Do you strongly agree, rather agree, rather disagree or strongly disagree that using mobile phone has helped you

(READ OUT – ONE ANSWER PER LINE):

Strongly agree	4
Rather agree	3
Rather disagree	2
Strongly disagree	1
[DK/NA]	9

A. to keep in contact with family and friends?	1	2	3	4	9
B. to be more informed?	1	2	3	4	9
C. to better manage your free time/leisure time?	1	2	3	4	9
D. to share ideas and material like photos etc. with other people?	1	2	3	4	9
E. to feel more secure?	1	2	3	4	9
F. in your work?	1	2	3	4	9

Ask ALL

Q11. To what extent do you agree, or disagree, that people who do not use a mobile phone [INSERT A-D]? Do you strongly agree, rather agree, rather disagree or strongly disagree?
 (READ OUT – ONE ANSWER PER LINE):

Strongly agree	4
Rather agree	3
Rather disagree	2
Strongly disagree	1
[DK/NA]	9

A. miss the opportunity of having more contact with family and friends?	1	2	3	4	9
B. are less reachable by the outside world?	1	2	3	4	9
C. are saving money in purchasing such devices and on their telephone bills?	1	2	3	4	9
D. have less stress in their lives?	1	2	3	4	9

6 Annex C: Multicollinearity Tests for the Regression Models of Chapter 3

Muticollinearity represents a problem when the independent variables are highly correlated, which causes increased variance of the parameter estimates, and can be responsible for problems concerning small changes in the data causing high swings in parameter estimates.

The measures of multicollinearity are tolerance, and Variance Inflating Factor (VIF). Tolerance is the share of variance represented by an independent variable, which is not related to other independent variables in the model, and VIF is the reciprocal value of tolerance. Literature usually regards VIF values over 5, which raises concern, and values over 10, which indicates serious collinearity problem (Menard, 1995). However, mechanical decisions on the bases of these rules of thumb may cause that researchers delete variables from models, which are statistically solid for answering the research question. The decision on whether the estimate is reliable depends on the variance of the independent variable, which increases with the sample size. Therefore, a trade-off exists between sample size and multicollinearity: being all other things equal, a model with VIF 20 is better than one with VIF 1.25, if the sample size is four times higher (O'Brien, 2007).

VIF and tolerance measures are the same for the EU level linear and logistic regression models in the study as the same data are used with the same independent variables each times. VIF measure is the highest for Internet use (3.4) followed by the dummy of age 15-24 (2.6). For the Internet use typology variables VIF values are low, between 1.5 and 2.

Collinearity of the Internet use variable is mostly due to its correlation to other Internet variables in the equations: Internet access (without use) and daily Internet usage. If we omit these variables from the equations, its VIF value decreases to 2.1. Therefore, the collinearity was induced by the model specification, which was created to separate the effects of different levels of internet access and use.

As the sample size is very high in the analysis, and all the VIF values of the independent variables are below the value of 4, it is not necessary to modify the structure of the model due to multicollinearity problems.

Collinearity diagnostics of the independent variables in the regression models

		tolerance	VIF
Internet	Access	.532	1.878
	Use	.296	3.379
	Daily use	.420	2.383
	Instrumental	.616	1.624
	resource enhancing use	.536	1.866
	Recreational use	.619	1.615
Age (reference: 25-39)	15-24	.385	2.596
	40-55	.609	1.642
	Over 55	.416	2.402
Education finished at age (reference: 15-20)	Less than 15	.737	1.357
	More than 20	.746	1.340
	Student (not finished)	.405	2.469
Occupation (reference: employee)	Self employed	.863	1.159
	Manual worker	.834	1.199
	Not working	.468	2.138
Residence (reference: other urban)	Metropolitan	.814	1.229
	Rural	.808	1.238
Household type	Single	.947	1.056
constant			

7 Literature

Menard, S. (1995). Applied Logistic Regression Analysis: Sage University Series on Quantitative Applications in the Social Sciences. Thousand Oaks, CA: Sage.

O'Brien, R (2007). A Caution Regarding Rules of Thumb for Variance Inflation Factors. *Quality & Quantity* 41:673–690