Information Society

Information Society

From Theory to Political Practice

Coursebook

Gondolat – Új Mandátum, Budapest, 2008

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

Edited and introduced by
Róbert Pintér

Scientific advisor
Tibor Dessewffy

Translated by Attila Kincsei, Gabriella Moise, Zsófia Molnár, Ágnes Nagy, András Rohonyi, Krisztina Sarkady-Hart

Copy editors Fruzsina Gyenes, Adrian Hart, Alan Richardson, András Rohonyi, Chris Sadler

Library of Congress Cataloging-in-Publication Data
The Information Society 1st ed.
cm 23,5x16,5, 256 pages
ISBN 978 963 693 623 0
1.Information Society 2. Information Technology 3. Social Networks 4. Innovation 5. European Union 6. Electronic Government 7. E-learning

www.gondolatkiado.hu
This book is available at NET-IS project in English, Greek and Hungarian: *www.ittk.hu/netis*

Table of Contents

Preface

The last ten years has seen, in the European Union, a greater focus on the 'information society' than ever before. Besides political programmes and economic development projects, numerous exciting research projects have been conducted and scientific publications have appeared. At the same time, people can increasingly perceive in their everyday lives that they are living in an information society. This is why Information Society Studies has been included in higher education curricula in many countries. Despite this, young professionals often find it difficult to fully appreciate the complexities of this field - partly due to deficiencies in higher education programmes and partly to the wide array of issues that Information Society Studies encompasses, from enabling technologies to shifts in the nature of society, it's governance, economics and culture. Because the challenges presented by the information society can be felt in every sphere and sub-system of society, including amongst others, culture, education and healthcare, it is necessary to provide all participants in higher education with knowledge about the information society. When they encounter questions and dilemmas relating to the field, they will be able to recognise the applicability of their newly gained knowledge to society, the economy, politics and culture, i.e. to their own lives.

The aim of the NET-IS (Network for Teaching Information Society) consortium, with the support of the Leonardo da Vinci Programme, is to develop a course which can fulfil the above-described role and provide an introduction to information society studies for all those interested. This course book is one result of this initiative and has been published in Hungarian, English and Greek. The course book is supplemented with a separate collection of readings to provide further help to students, and the course will be taught, from the autumn of 2007, in several institutions of higher education in Hungary, England, Greece and Slovakia, both through traditional learning and *e-learning*. We hope that a model course will be designed based not only on the prepared teaching materials but also on the experiences of teachers and students as well as, and that it will stand its ground anywhere in Europe.

Of course it is not only students who can benefit from a course book like this but also teachers, researchers, experts and all those who find this area interesting. Because the book is written in modules with each topic being an independent unit in itself as well as forming part of the larger whole, it is not necessary to read the book in its entirety. The book contains thirteen chapters and covers the following topics:

- the concept, theory and history of the information society,
- the social role of technology,
- network society and economy,
- use of space and changes in social relations pertaining to space,
- the growing significance of innovation in the economy and in society,
- issues of legal regulation,
- the information society strategy of the European Union,
- electronic government and administration,
- the digital divide and e-equal opportunities,
- digital culture, the digitalisation of the cultural heritage, information literacy,
- electronic education, life long learning.

Naturally, a course book of this size cannot address all relevant issues in all areas. The aim of the book is to provide students with a strong theoretical background, placing special emphasis on the possible inter- pretations of the political applications and approaches taken to the subject. That is why issues relating to information policy, digital equal opportunities, electronic government and digital culture, for example, have been included. A detailed explanation of what guidelines were followed in narrowing down the broad theme of information society to the topics dealt with in this book can be found in the final, closing chapter.

It is important to emphasize that this course book primarily takes the approach of social sciences since there are other complex and detailed approaches that could be taken to the information society focussing more on economic, political or cultural aspects. We decided to assume a more general approach so that the book could prove useful not only in programmes devoted to economics, political science or culture (e.g. for cultural anthropology, communication science, cultural management) but could also provide a sound foundation for students of almost all courses thus opening the way to more specialised studies on the subject.

Finally, here are some short "instructions" for the book. At the end of each chapter can be found a short summary, accompanied by a set of revision questions aimed at checking factual knowledge and generating new ideas, together with a bibliography whose sources will facilitate a deeper understanding of the chapter's topic. **Bold and underlined** terms essential to the theme of information society appear in the main body of the text. Their definitions can be found in a separate section at the end of the book as can the References – which form a kind of bibliography for the whole theme.

We would hereby like to extend our thanks to all those people and organisations that helped create this course book, and especially the Leonardo da Vinci Programme, which provided the opportunity for its preparation and publication.

On behalf of the members of the consortium:

Information Society Research Institute (ITTK), Budapest University of Technology and Economics, Budapest, Hungary (consortium leader)

Department of Informatics, Alexander Technological Educational Institute, Thessalonica, Greece

Information Society Education and Research Group, University of West Hungary, Sopron, Hungary

Praxis Center for Policy Studies, Tallinn, Estonia
School of Computing Science, Middlesex University, London, United Kingdom
SCIENTER, Bologna, Italy
János Selye University, Komarno, Slovakia

Róbert Pintér, editor
Budapest, July 2007

RÓBERT PINTÉR

Towards getting to know information society

A BRIEF INTRODUCTION TO THE STRUCTURE OF THE CHAPTER

Let us take a closer look at the term **"information society"**. It must sound familiar since we have most probably heard the term either on television or on the news, spoken by a politician or an informatics company representative. Do we know what it means exactly? To answer this question we need, through a thorough inspection of libraries, the Internet, the Web and our immediate surroundings, to explore three relevant fields to grasp the essence of this concept.

1. First of all, we approach the issue on the level of everyday life and examine common dilemmas and the so-called introductory discourses that, in an ideal case, could lead us to a more meaningful level of understanding.
2. Secondly, we put the concept itself under examination and deconstruct the assumptions underlying the two component parts "information" and "society".
3. Finally, social science research has already been conducted in this field, thus we look through its literature and research practices in order to discover the meaning of the concept.

As a result of this approach the conceptual network can be explained along with a general understanding of information society. The following chapter deals with the history of the information society and examines the relationship between the concept and related notions such as knowledge society. Subtopics and politically highlighted fields are discussed in further chapters of the book. This serves as a springboard for further explorations of related fields. The objective of the introductory chapter of our course book is nothing more than to prepare the ground for the following chapters in order to facilitate a better understanding of terms and concepts.

THE INTRODUCTORY DISCOURSES OF INFORMATION SOCIETY

"Every age, every generation has a right to have its own utopia," wrote Nobel-prize winner Joseph Brodsky in his essay entitled *Collector's Item* right after the fall of the Soviet Union. The newly emerging generation in the Cold War era, whose members attended secondary schools and left them after 1990, can unquestionably claim a utopia of a different nature. Apparently this utopia, or dystopia as some view it, is information society.

Everyone has his or her more or less well formed opinion about the information society, the Internet and its influence on our everyday lives even if they have never used a computer or surfed the Internet. Most of these opinions are fed by the discourses on information society and the Internet presented in the media. The introductory discourses concerning these themes – which could lead to a profound understanding of inherent relations – show us the actual origins of the popular concepts and related attitudes, and the way they distort the interpretation of the concept which is the focus of our inquiry.

Primarily, there are three discourses guiding us into the depths of information society. To know and understand these could help to dismantle the onion layered structure of the beliefs and values wrapped around the information society.

1. Discourse I: The Internet comes from the devil

The first discourse revolves around common fears and beliefs related to the Internet. According to some of these the Internet abounds in pornographic and paedophile contents, it stirs up violence and ignites hatred, while whoever utilizes it is involved in bomb making. Its users become addicts, lonely, incapable of communication and mentally twisted.

Krajcsi (2000) collects these misconceptions and all the Internet related problems, "the old troubles of the Internet," as he calls them, and claims that "the often cited harmful mechanisms that are considered to be the threats presented by the Internet are not at all related to the net but rather to old dangers which had existed before and resurfaced in the Internet era" (Krajcsi, 2000: 3):

Some examples of this:

- The question of reliability: you cannot know who is at the other end of the communication channel.
- Authenticity: to what extent can we trust the information from the Internet?
- The loss of the sense of reality: those spending too much time online lose contact with reality.
- Alienation: those addicted to the computer gradually lose their relationships with other people.
- There is a loss of identity: you can become whoever or whatever you want on the Internet as a result of which you yourself no longer know who you actually are.
- Aggression: computer games are alien to human life and make their users violent.
- The appearance of extremes: pornography and paedophilia; the Internet is the favourite gathering point for men of unnatural inclinations and extremist beliefs.
- Communication becomes impoverished: the potentials of the new means of interaction result in the loss of vibrant communicative practices so that language becomes stunted.
- Data smog: the abundance of information overwhelms the users since there is no of finding one's way through the mass of data.

When we consider these negative notions several counter arguments also arise. First and foremost, the basis for these false beliefs is a distorted view of the media in general and the logic of its inherent mechanism. This suggests a certain urge for negative sensation, since the media is exclusively preoccupied with unusual, extraordinary incidents; and the extra-

ordinary usually means something disastrous. There is nothing sensational in the successful landing of an airplane or, to stick to the original theme, in downloading and reading one's e-mails. The abnormal and the pathological appear right away: the plane crash, the paedophile pictures, or the instructions for making a bomb. Eventually, the world, or at least that particular segment which appears in the media, is suggested as abnormal and pathological, which is not true. The problem is that at the beginning the Internet related news was almost exclusively shocking, with appalling phenomena appearing routinely in and about the Internet. This is still partly true even today.

There is, however, another reason why the Internet is so severely criticized. Our fears and superstitions are fed by inherently psychic characteristics. One such human feature is a fear of the unknown, novelty in general or any radical changes in life. Another typical human attribute is that people tend to formulate opinions on matters they do not know and do not intend to study. We frequently create stereotypes of others (which are sometimes an indispensable condition for survival) but the truth and value of these stereotypes is relatively small. No wonder then that the supposed immensity of changes that were once assumed to follow automatically on the introduction of the Internet, the idea that it would totally change our lives evoked fear, and aroused our instant, perhaps unconscious negative reaction; the result was resistance.

However, there is nothing mystical about the Internet. *It is exactly the same as the world that surrounds it,* a claim that can be easily justified since the world is also violent, certain people are evil, and sexuality appears considerably in our everyday lives as well. The world is reflected in the contents of the Internet and its usage. Obviously, it is not only the negative aspects which appear in this mirror but some worthy ones too. Numerous humanitarian initiatives have been able to strengthen their forces with the help of the Internet (such an initiative is the green movement whose public image was considerably altered positively and which became effective through the Internet). *We should not disregard the fact that there is nothing else on the Internet, but uploaded content that had existed in the real world beforehand;* it is nothing less, nothing more.

The second counterargument is much more significant than the previous arguments: the negative representation of the Internet disregards the fact that the exploration of the structure and dilemmas of the information society cannot be reduced solely to the examination of the Internet. The two, to put it simply, are not the same and they are not identical. The Internet is a worldwide network, whereas information society is one potential mode of social existence. Anyone who condemns the latter based on false assumptions of the former makes premature judgments before getting to know the concept itself. In effect, the Internet incorporates numerous other media, unifying their communicative characteristics.

The information society not only differs from the Internet but also exceeds it. The Internet is only one of its significant features and techniques in such a society. Information society, in accordance with Castells' theory, (which we will discuss later) is the new mode of human existence where the organized production, storage, retrieval, and utilization of information play a central role. New structural elements and networks appear through which a certain "network society" is being created accompanied by appropriate institutions that are transformations of those already existing. As a result of this, on the macro level, politics, economics, and culture are reformulated, as are the institutions of the mezzo level and at the micro level, families and individuals experience similar changes (Castells, 1996: 13-18).

2. Discourse II: everything is bright in the future

The second discourse appears in the dispute taking place between enthusiastic devotees of futurology and more down-to-earth people. Numerous books were published in the 1970s both in the US and several Western European countries discussing the future of everyday life and the dominant trends for the future Toffler (1980) Naisbitt (1984). We can see from the dates of their publication these works appeared much earlier than the emergence and wide spread distribution of personal computers or cell phones, and well before they turned into mass-produced products. Thus the bright future depicted in these "masterworks" of the early futurologists could not be considered as scientifically oriented works fed by personal experience or experiment of the age. Roszak's *The Cult of Information* (1994 [1986]) that appeared at about the same time also comments on the phenomenon: "Books like these belong to that immensely popular category of contemporary literature called futurology, an ungainly hybrid of potted social science, Sunday supplement journalism, and soothsaying (1994: 21). This means that, in case we intend to grasp the essence of their success, a futurologist' work gains its authenticity through some sociological attribute, the "Sunday supplement journalism" makes it easily digestible, whereas its prophetic tone creates a "pleasing thrill" and excitement in the same manner as science-fiction does. If the sociological element turns out doubtful and fake; if its prophecies become outdated; since it is not about the future anymore but the recent past, relating the wonders of 2000 to the stale fashion of the 1980s. In addition to this, its journalistic style becomes impoverished, and these books simply lose their imaginative power. The missionary faith these works laid on technology remains their sole hope to regain some of their former status.

Lacking any personal experience these technophile writings targeted one single issue, in the then future, our present; namely that people would not be adequately prepared for the sudden changes in their lives. Undoubtedly, this is a modern problem since information literacy, skilful employment of informatics and the development of a future oriented consciousness are all the focus of the information society; being prepared is not sufficient for the foundation of the information society.

The best criticism levelled against the arguments of the devoted supporters of the information society articulates the inadequate picture of the information society. Its disciples failed to introduce the disadvantages of changes; they tend to forget that in this process some will win but some will lose out. The fact that the losers are rarely mentioned is because the themes of those discourses related to information society are primarily defined by those who succeed. Thus, the winners' terminology prevails. The language they use is exclusively used and understood by them, while those on the periphery do not even get the chance to have their voices heard. Another serious danger is that the winners, mostly technocrats, politicians, and economic leaders, have a naïve image of society which fails to show the world in its inevitable complexity. Obviously, it is a myth that any technological change can guarantee avoiding any kind of failure or loss. Neil Postman in his 1990 lecture given to German informatics students drew attention to the Faustian pact of information technology, which is similar to that of any other technological innovation. Because technology is a give and take game the amount of the gains never, necessarily, equally balance lost value. On the social level, certain groups in society are strengthened while others are weakened. In the same way

locksmiths did not hail the appearance of the automobile, as these particular technological changes would have had their own victims too (Postman, 1990).

Another similarly critical argument against the information society is the idea of a "top-down revolution"; this suggests that the beneficial changes of information technology are initiated from the topmost layer of society and that they are instituted by the representatives of economic and political power. The changes, however, are much less "socially" based than one might suppose: the demands are not rooted in society but in economic advantage and it is power relations that urge them on. While almost half of the adult population in Germany experience the new media environment as a force that makes social orientation all the more difficult, those in favour of development judge these people as having a "false mentality" and emphasize the importance of jumping on the bandwagon (Bernhardt-Ruhmann, 1995 quoted in Döbel, 1999). However, it is obvious that without the cooperation of the majority of society there will be no chance of building the information society; in a non-utopian realist social model the human factor cannot be excluded.

The uncritically enthusiastic view of the futurologist fails and, it is not anthropocentric enough either. This image of information society is utopian since it claims that technological development will annihilate all social inequalities. This myth cannot be kept up anymore: the information society promises no redemption; the inequalities merely reproduce themselves in altered forms.[1] Futurology that depicts the future of society with the help of technological determinism cannot answer the questions raised by complex social issues.

3. Discourse III: Athens or Orwell?

The third discourse rehearses the intense argument between the technophiles and the technophobes. Those involved are often not aware of having taken sides with either the uncritical positive view of technology or the contrary negative approach. However, without an unprejudiced, value free scientific attitude to this controversy it is difficult to develop an unbiased view. This also hinders the process of getting close to the central issues involved. The dispute between the so-called *Athenians* (technophiles) and the *Orwellians* (technophobes) becomes a vulgarised scientific discourse. As it will turn out, the first discourse elaborated above reflects the fears of the technophobes, while the technophiles are enthusiastic futurologists producing promising visions of a bright future. One should ask questions about the origins of technophilia or technophobia; to what extent is it rooted in our human nature? Perhaps the seeds of these prejudices are present simultaneously in our unconscious, and one will prevail over the other powerfully and coherently only in the course of time?

In accordance with the Athenian model technology should have a liberating effect and by enhancing human prosperity, it will eventually lead to the development of a new electronic democracy. The 2,500-year-old Greek city state's direct democracy will be able to regain its power in a new digital agora. The Orwellian model was coined after George Orwell's cult

[1] It is worth noting, however, that the authors mentioned above were not so optimistic after facing reality at the time of writing what were then influential works. The emerging digital abyss of the 1990s, the problems appearing with the technological developments and rapid changes disillusioned both Toffler and Naisbitt (cf. Toffler, 2005; Naisbitt, 2005).

book *1984*. Its supporters claim that the inevitable effect of new technology will be the surveillance and subordination of the people. Everyone can be observed, and the technology of total surveillance is ready to be launched. At the end of the story, the evolution of *Homo sapiens* might end. Worse, new intelligent machines may annihilate the human race. Dystopia takes control!

It is valid to dismiss these extreme visions. They are projected so far into a distant future that even if partly based on reality they are too far removed from everyday life to be realized. Even if mass surveillance arises as a significant problem, our evaluation of present democracies indicates there are inbuilt guarantees in democracy for the management of such centuries old difficulties with the misuse of power. These past guarantees may need revision in order to accommodate the altered circumstances thus preserving their efficiency and recognition.

Certain critics of information society claim that one thing will undoubtedly change, that is, power relations between the state and the citizens. Whereas the state attains increasingly efficient means of surveillance, citizens can gain easy access to information that they can employ against any transparent and controllable state mechanism. There is a gradual expansion of the individual's freedom that runs parallel with the rising transparency of the state. This implies that both sides by fulfilling opposing interests can utilize the new processes. It is not only the state that gains further resources but citizens too.

However, the potential costs of the Athenian model are too irrational: who would give up the bulk of their free time for the sake of direct democracy in order to make political decisions? Especially if there is no need for such a thing. We know that only a minority of all citizens would (or could) take an active part in political decision making on a daily basis. To create the potential access to electronic information and publicity for issues is highly desirable in order to let citizens freely voice their opinions in all circumstances, but it might not be wise to force this upon the public and to create a directly democratic political system out of it.

4. Questions leading to the core of the matter

After succeeding, we hope in a more or less unprejudiced evaluation of the attitudes and arguments relating to the three discourses of the information society we may finally arrive at further questions devoid of misconceptions, which could lead us to the core of the issue.

We alluded to the problem of *surveillance in discussing Orwellian pessimism above.* The life of the citizen as a consumer can be tracked, without doubt, through an increasing level of precision by a sophisticated range of information technologies. This implies virtual dangers. We need only indicate governmental initiatives right after the September 11, 2001 attack or the tendency companies have to create databases of consumer profiles. Indeed, every single citizen can be surveyed. Questions concerning the consequences of this development automatically arise as do operational matters now and in the not so near future. Especially with reference to the propaganda that plays such a crucial role in the political mechanisms of modern democracies where the possibility of media examination of the state is apparently strengthened.

The second vital matter is the issue of *accessibility,* which encompasses several interrelated phenomena. The new, intensified pace of living requires the use of gadgets as a necessity not only for taking part in public life, but also for work. Participation using these accessories is voluntary, not compulsory and may not necessarily always offer a pleasant experience, even during popular leisure activities and social interactions. If we are to be real participants in the development of our information society then equal access to technologies and their contents is necessary. How can we achieve this if, on the one hand, acquiring technological instruments has its price, and, adequate knowledge is needed to operate those means? What happens to the "outsiders"? In order to consider this issue of accessibility by the individual, we have to face complex matters of technology, information, knowledge and difficulties with personal finance.

Inaccessibility is only one side of the coin; *information(al) stress* is the other. If everyone, or at least the great majority of a society, participates in the information flow, still another difficulty emerges. That is, the heavy burden of the information on the individual. This may mean that the problem of accessibility provides its own final solution (a vision projected by the concept of information society) How can we cope with such massive changes in our everyday lives? With regard to mass accessibility to information, we must also take into account the new levels of tension the population must endure as a natural result of stress. This is not simply a theoretical issue but a practical matter deeply incorporated into our decision making in everyday life, though it may not concern the bulk of the population in the short term.

It is now clear that the difficulties regarding the concept of information society originate from an entirely different source than either the technophiles or the technophobes would like to argue. The intense expectations which led them to be either in favour of the idea or to condemn it make a purely scientific and worthy dispute totally impossible. An alternative, *Technorealism* is a movement which was born in 1998 (Shenk at al, 1998). The founders searched for supporters through the Internet resisting both disputing groups' irrational claims and attempted to approach technology realistically without falling into the trap of extremes, neither overestimating nor underrating the potentials of technology. The postmodern manifesto of **technorealism** he propositions of a realistic approach to technology as follows:

1. *Technologies are not neutral.* Every technology conveys both intended and unintended social, political, and economic contents. Their function is predetermined. Those holding a hammer search exclusively for a nail to drive in.
2. *The Internet is revolutionary, but not Utopian.* It embodies revelatory and assertive effects, it also has a perverted, pernicious aspect too, but in most cases it is trafficking in mundane content.
3. *Government has an important role to play on the electronic frontier.* Each governmental system has to accept the newly created rules and attitudes of the cyber sphere; alternatively it is their right and responsibility to assist the process of integration of the traditional social system into the cyber sphere. Technological standards, data protection and privacy are far too significant to be solely governed by the regulation of the market.

4. *Information is not knowledge.* One should not mistake the intensified information flow – or the introduction of technology to transfer excessive quantities of information – with knowledge, let alone wisdom.
5. *Wiring the schools will not save them.* The extension of the technical apparatus of a school does not automatically raise the level of education in that particular institution.[2]
6. *Information wants to be protected.* Although it is true that the cyber sphere has had an earthshaking impact on copyright and other intellectual property rights, it does not mean that information is freely available for everyone, or that information "wants to be free". The aim is the same as in the "normal" world: information belongs to the one who produces it. The potential must be offered for everyone to have free rights protecting his or her intellectual property.
7. *The public owns the airwaves; the public should benefit from their use.* The employment of new technologies must serve the prosperity of communities and citizens, and resources must serve educational, cultural, and community goals.
8. *Understanding technology should be an essential component of global citizenship.* An understanding of the potential gain, and the limits of technology, is essential for becoming a responsible citizen.

Summarizing the essence of Technorealism one would conclude that universal access to information technologies does not mean that, necessarily, we achieve a better or qualitatively different society. Citizens' active participation and the rational evaluation of technological progress are indispensable to establishing the information society.

INFORMATION, SOCIETY, INFORMATION(AL) SOCIETY

"Information society" – on hearing the term it appears straightforward enough to understand the meaning conveyed by its two component parts. "Information" indicates a certain attribute of society where information as such plays a crucial role that transforms this particular society whose difference from others rests in its quality of, and access to information. Before we immerse ourselves in the exploration of the concept itself, let us focus on the meaning of the two components separately.

1. Information

Information in the vernacular is what we can find at a railway station or in a department store information desk where certain instructions, guidance, directions or data are provided to let people know about the timetable of trains, or the arrangements in that particular shop. Such

[2] This proposition does not appear to fit. It can be explained by the origin of the manifesto which was written in the US where at sometime in 1998 the Clinton administration proposed the wiring of schools as part of its educational policy; an initiative which evoked harsh criticism. The whole educational system was desperately in need of renewal, which could not be resolved solely by obtaining the new information technology. This proposition, however, may be generally employed too: wiring any institution cannot be the sole means of regeneration.

information exchange works only if the right piece of information, the one that fits and makes sense for both parties of the communication is available. István Örkény writes about this in his one-minute story entitled *Information.*

> A man has been sitting by the main gate behind a small sliding glass window for the past eleven years, and in all that time people have asked him only one of two questions.
> "Which way is it to the Montex office?"
> And he said:
> "First floor to the left."
> The second question was:
> "Where can I find Gum Residue Recycling?"
> To which he replied:
> "Second floor, second door to the right."
> For eleven years, he had never made a mistake and gave everybody the right instructions. Then one day a lady walked up to the sliding window and asked him one of the two routine questions.
> "Could you please tell me where the Montex office is?"
> But this time, quite exceptionally, he gazed into the far distance and said:
> "We all come from nothing, and to a great big fucking nothing shall we return."
> The lady lodged a complaint with the management. The complaint was investigated, debated, then dropped.
> After all it was not such a big deal. (Örkény, 2006)

Over the last thirty or forty years, the concept of information, as it appears in everyday speech, has altered, so that the limited sense in which it is used in the story is now rather rare. As a natural consequence of this our confidence that we have a vague idea about what the term could mean has been undermined.

This is mainly because we live in an information-centred world and because of the penetration of communication related technologies. In the industrially developed western societies almost everyone experiences information society, which suggests that information has become something essential, a central, indispensable component of our society.

Information studies offers relatively complex definitions for information.[3] Our intention, however, is primarily to approach the concept with simplicity, bearing in mind that "information society" is the focus of our exploration and not "information". Starting our analysis with the most obvious step, let us look up the term in a dictionary first: we find several meanings of the word "information". *Pallas Great Lexicon* Volume 9 reveals that the expression comes from Latin and it means "notification, report; to announce, to notify; messenger, educator, announcer" (*Pallas Great Lexicon* Vol. 9). The *Thesaurus* offers the following meanings: "(1) instruction, guidance; report; (2) intelligence, data, news, a collection of facts; (3) *Com., Math., Gram.* in the theory of cybernetics: the properties of the matter reflected in signs; intelligence/news.".

The definitions of other thesauri do not offer radically different meanings from the ones quoted above, although some of them attempt to dress the expression up with niceties. The fourth edition of *The American Heritage Dictionary of the English Language* distinguishes seven different meanings of "information".

[3] Consult Martin's (1995: 17-26) detailed summary on this.

1. "Knowledge derived from study, experience, or instruction.
2. Knowledge of specific events or situations that has been gathered or received by communication; intelligence or news.
3. A collection of facts or data: *statistical information.*
4. The act of informing or the condition of being informed; communication of knowledge.
5. *Computer Science.* Processed, stored, or transmitted data.
6. A numerical measure of the uncertainty of an experimental outcome.
7. *Law*. A formal accusation of a crime made by a public officer rather than by grand jury indictment."

With the exception of the field-specific meanings we can conclude that "information" is an expression related to: experience, the communication of knowledge and experience, data, knowledge, learning, communication, and news. In certain cases "information" appears to be identical with these concepts (e.g. experience, data, knowledge, intelligence), in other cases it is the subject of them (e.g. instruction, learning, communication).

Even if these might seem too vague to grasp the essence of "information" as it exists, the triad of "data", "knowledge", and "communication" is sufficient to achieve our goal. What is the relationship between these concepts? In accordance with Drucker's definition one potential relation is based on the idea that the *transformation of data to information necessitates knowledge* (Drucker, 1988). A number of definitions attempt to link information and communication too, which could be significant for the clarification of information society. Consequently, *communication is the transmission of information taking place in one particular context.* If we join these two approaches we acquire a picture of considerable nicety since the quartet of data, information, knowledge, and communication can be interpreted in their complexity. These four ideas cannot easily be distinguished from each other since, on a daily basis, there is an extensive overlap in their employment.

Michael Buckland sums up the conceptual interrelations in a chart in the introduction of his work on information systems:

1. Figure. The four aspects of information

	INTANGIBLE	TANGIBLE
ENTITY	Information-as-knowledge Knowledge	Information-as-thing Data, document, recorded knowledge
PROCESS	Information-as-process Becoming informed	Information Processing Data processing, document processing, knowledge engineering

Source: Buckland, 1991: 6

Information-as-knowledge is exclusively subjective, it is linked to one particular person and gains its meaning in one particular context. As an entity, it is intangible but it can be communicated and also shared with others. *Information-as-thing* exists similarly to

knowledge, yet it is recorded hence it is tangible; data also belongs here, that is recorded knowledge, since its employment requires the recognition of a certain context i.e. the structure of data recording, without which data could not be decoded.

The third group of information-exchange called *information-as-process* is essentially equal to the process of *becoming informed,* consequently, it links information-as-thing with information-as-knowledge. However, it can join two information-as-knowledge (*the process of cogitation)* or two information-as-thing entities *(data processing),* as well.

On analysing "information" one has to examine these groups and their components: knowledge, communication, data, information processing, thought, and other concepts of data processing.

2. Society

Defining "society" is apparently a much more simple task to accomplish, although it is problematic to define what we call society and what its relationship might be to a geographic unit, a nation, a language, a culture, the state and statehood.

A dictionary might be useful again here and this time a social science dictionary would be the most useful. The Collins Dictionary of Sociology defines "society" as follows:

1. The totality of human relationships.
2. Any human group that perpetuates itself more or less linked to one specific geographical region, holding its own *institutions* and *culture;* both tribes and nation states in the modern sense belong to this category.

Although "society" is one of the most significant and often cited terms in sociology, the second definition is the main cause of a lot of difficulties and provokes debate over its meaning. While modern societies may be distinguished in political, economic, cultural, and geographical respects – they may have also developed a sense of nationhood – the empires and tribes of earlier times cannot be defined simply like this. Consequently there are disagreements about whether or not they should be considered as societies at all. Empires provoke the question whether or not they can be regarded as unified societies, while tribes – due to their size and population – can hardly be defined as societies.[4]

Currently the criterion for a community to be defined as a society was the potential for their members to interact with each other: what counted was the frequency and scale of these interactions. Even in the most isolated societies there must exist some communication among its members, otherwise they could not be called societies. Another criterion for recognition of a society, besides those above is whether its cultural and institutional continuum could be sustained in the course of its history.

However, the most recent sociological trend shows a different direction. Society as a basic concept may no longer be the key to getting to know our world since the examination of single societies may divert our attention from other interactions taking place between and beyond societies such as multilateralization or globalisation.

[4] Anthropologists might dispute this.

3. Information and society as one

We are now aware of the meaning of both the ideas of information and society. The question that arises is: what might they mean as a unified concept? Depending on our understanding of the two terms, one might visualize a society in which information and related phenomena (knowledge, communication, data, information processing, thought, and data processing) gain unprecedented significance. Where they occupy a central role which determines human relationships and social reproduction and continuity, spatial ties, institutions, and culture and the idea of the nation state. Presuming there must be a frequency of interactions (social interrelations) for any society to exist, then information society may bring virtual changes in this field: at a much lower cost, in a much easier manner, allowing many more people to interact with each other.

However, there is one lesser important aspect that should not be forgotten that is that the compound of the two terms information and society does not work similarly in every language. Depending on the language the concept itself either differs from the already accepted idea or it coincides with the original meaning. In Hungarian, for instance, "information" turns into an adjective denoting "informational society". In English, however, the compound is composed of two nouns, which means that the term works by the simple juxtaposition of the words.[5] This differentiation must be recognised since the concept does not simply name "the society of information" but also denotes an attribute of society. Thus for a proper understanding of the term one should bear in mind that "information" functions as an adjective here, and means "informational" not merely "information".

The concept of information society instantly raises another question; namely, the supposition that every single society can be considered "informational". Information is an indispensable pillar for the proper functioning of any society and social subsystem; it has played an active part in the process of every social formation, and in shaping industrial and agricultural societies historically, before our present time. This critical observation is often raised against the contemporary appropriation of "information society". The critics point out that this use of the concept neglects the fact that without information (knowledge, data, thought, communication etc.) there is no society and never was. While undoubtedly true, since all societies necessitate information flow, yet none of them were called "informational" by contemporary critical thinkers or historians. None of the previous societies were so extensively influenced by the communication, reception, processing, recording, decoding, and flow of information as ours are. The re-evaluation of earlier societies provides contrasts with mod-

[5] In Finnish, however, the situation is even more complicated. The term "informaatio" exists, though the word "tietoyhteiskunta" is widely adopted instead, which is a word for word translation of "knowledge society" in Hungarian. Manuel Castells' and Pekka Himanen's book on Finland's information society, T*he Finnish Information Society Model (Suomen tietoyhteiskuntamalli, Castells-Himanen, 2001),* reflects upon this shift of terminology; in English to signify the concept "information society" was used (Castells-Himanen, 2002). In Finnish to denote "information" the word "knowledge" (tieto) is used; no wonder that "informatics" is tietotekniikka ("knowledge technique"), whereas "computer" is tietokone ("knowledge machine"). Most languages adopt the word of Latin origin "information," while the Finnish example is an exception. ("Information society" proper comes from Japan 'joho shakai, johoka shakai'–as the later chapter by László Z. Karvalics elaborates on it.)

ern characteristics of present day societies which differentiates them sharply from the past. Theorists from specialist perspectives, field of interest, orientation, and mode of thinking indicate these differences in five realms: technology, occupation structure, the operation of economy, spatial structure and finally, culture. These fields will be briefly discussed in what follows.

SCHOOLS OF SOCIAL SCIENCE

Frank Webster's work published in 1995 synthesizes the 1960s and 1970s **information society theories** in order to analyse the concept and its characteristics within the context of social science. These theories designate the potential directions of what might be a comprehensive research project, which can clarify the concept and exploit these theories as starting points for further exploration. Webster's typology is the following:

1. Technology

From the technological perspective we live in an information society since information and telecommunication technologies play a constantly expanding role in all fields of social existence, which has shaken the foundations of social structures and processes and resulted in massive changes in politics, economy, culture, and everyday life.

Most of the attempts made to define information society approach the idea from a technological point of view hence the central question of such explorations sounds like: What kind of new information and communication technology was constructed in recent decades that determined the infrastructure of information society?

Several other issues need clarification, as well. How are these technologies brought to life? Does their application fulfil their originally intended purpose? How are they distributed in society? Are they widely accepted or, conversely, are they rejected?

The most important question, however, is the one that focuses on the relationship between technology and society. This is a matter that at first may seem too theoretical but on second thoughts, turns out to be fundamental. What is the optimum technological impact on social life that can achieve a *qualitative change?* Are we justified in relying on modernizing political initiatives and the theories of futurologists who claim that technology is the only means to change social procedures and the functioning of society, when their objective is to expand the use of technology in the public sphere?

2. Occupation structure and economy

Studies of occupational structure and economy[6] *show that we live in an information society because, when we have passed through the agricultural and industrial stages, the information sector and information oriented jobs dominate the economy.*

[6] We simplify two of Webster's typology here and fuse them into one unit since the central subjects of their interests are relatively similar.

Two historically reputable schools of social science attempt to distil explanations based on changes to data on the means of production and occupation structure. Their protagonists pose the following questions: How have the proportions of employed workers changed in the industrial and service sectors in recent decades? How have their performance and the knowledge they use changed qualitatively? Have the so-called informational occupations begun to dominate production? Does the computer play an essential role in production? Who are the most influential participants and investors in this new world? Can a convergence that is a fusion of telecommunications, the media and computers be occurring?

The question is similar to that which we posed by the technological approach: What is the point at which we can claim that the logic of capitalism, that is, its structure of production has *qualitatively changed?* Is the often cited "new economy" indeed so different from the old one? Where is the turning point? Can we identify the point at which the former was replaced by the latter?[7]

3. Spatial structure

As the spatial theorists see it we live in an information society because through the use of information technologies and globalisation physical space tends to lose its determining function. People are participating in networks that determine such social processes as production, division of labour, discussing politics for example.

It is well accepted historically that the changes that occurred in medieval feudalism, the emergence of modernity, and the appearance of civil societies are all linked to urban settlement since towns were not dominated by feudal structures. Theories which are centred on the dramatically altered spatial structures of information societies focus on the exploration of towns and the network of urban settlements which survived as alienated remnants, and as enclaves in the milieu of the industrial societies. They focus on these issues in their analyses: In what manner do the human attachments to space change? Does the world follow the logic of networks? Does global society exist? Can it come to life? What is the inherent logic of global networks? Who belongs to them, and why do they wish to do so? What kind of social and economic capital is needed to gain access to a network and how can membership then be maintained? What are the innate social relations of the network, and what part do the new information and communication technologies play in those relations?[8]

4. Culture

Since our life is infiltrated by the globalised, extensively digitalized media culture that has become the primary means of providing sense and meaning for us and predominantly determines our life style, the cultural perspective may also claim that our society is informational.

[7] The issue of occupation structure and the white-collar revolution is elaborated by László Z. Karvalics.

[8] The theme of altered spatial relations is evaluated by Bence Kollányi.

The *Velvet Revolution* broadcast in 1989 was regarded as a milestone marking the beginning of a new era in which the function of the media shifted from mere documentation of events to their very production. An excellent example of this took place when the Berlin Wall fell and the television crews chased people back onto the walls because their earlier camera shots were not satisfactory. The question instantly arises: How and why did the cultural influence of the media increase to such an extent? Theories attempting to explain the cultural aspects of information society describe such a global cultural context that may be adopted universally as a referential framework for the media. This approach claims that the media enjoy a unique status in the age of information and that they are the most prominent determining factors of social relations.

One would naturally ask whether life exists beyond media culture or not? Does the illusory game of signs have any connection to reality? The catchphrase of the information age is "virtual reality" which reality very often turns out to be more fundamental than the world that created it.[9]

5. Manuel Castell's theory in a nutshell

Castells tries to answer all these questions in one complex theory. His profound description of the new information age attempts to show the way out of the theoretical maze of the value driven, strongly prejudiced, intricate information society. He proposes a conceptual model of a network with which the most recent phenomena of modern societies can be explored. His acknowledged social scientific work has been widely acclaimed academically. At the end of the 1990s he finally legitimised the information society as an academic field of research. Manuel Castells' three-volume opus (1996, 1997, 1998), as reflected in the title *(The Information Age),* is the first comprehensive scientific work amply supported by secondary sources, data which originates new concepts.

Castells argues that the information society is the new mode of human existence, in which the production, recording, processing, and retrieving of information in organized networks plays the central role. There is no evidence, however, that such a society exists. Again, Castells' argues that it is legitimate to point to a newly created mode of communal existence, if quantitative changes (e.g. more computers, a wide range of TV channels, extensive information flow) result in *qualitative* changes with respect to social interaction. The novelty of a society cannot be established exclusively by our acquisition of new goods or phenomena such as the dotcom companies bubble in the economy. It is not this which denotes the renewal of the economy; this is simply the old system gathering some new participants. However, where we see the regeneration of prior processes through the creation of new expectations, which transform the accustomed logic of social interactions (cf. its culture, customs, political system, production system etc.) then we may claim a change. This fundamental change that creates information society is the transformation of the structure of society.

Castells describes the comprehensive transformation of the whole of society in his trilogy. Information and communication technology provides the infrastructural background

[9] The phenomena related to digital culture are synthesized by Árpád Rab.

which is financially supported by the new heavily globalised network economy. A predictable consequence of this transformation process is the growth of social insecurity, a weakened capacity for prediction and plan-making, as well as the appearance of new social inequalities that create a "fourth world" of outcasts. Networking is the new logic, the new organizing principle of society. The rule is simple: those belonging to the network exist, while the network outcasts are non-existent. Since humanity is basically a self-centred entity, with its identity defined by one particular location and culture this process generates immense tension. Individual workers and the human labour force, in general, cannot pursue the constant wandering of capital and hence, job opportunities, on a global level. The tension ignited by the conflict of the Net and the Self serves as a life force for the new society. Real spaces are taken over by the "space of flow" where things of significance and value fluctuate incessantly. This leads to the birth of "real virtuality" in a cultural sense, where the virtual and reality merge and reflect upon each other.

The growth of tension is also reflected in social movements. Some of these (religious fundamentalists, for instance, among other reactive movements) withdraw into traditions and religious values regarding stability, and lack of change as something precious. Others, (anti-globalisation proactive groups) turn against the network society, ironically enough, exploiting the latter's own means of globalised technology and culture. "Global criminal economy" presents another difficulty that societies have to face, and to make things even worse, in certain countries such crime is entangled with the legal political power. This circumstance in the end is something that poses a threat to the entire globalised world.

The workings of the globalised information society eventually have its impact on everyone. However, not every individual participates in the construction of the new mode of living, in the same way as not all of us become part of the network.

SUMMARY

The primary aim of this introductory chapter was to synthesize the essential facts and ideas regarding the information society. Firstly, we were introduced to the introductory discourses on specific topics. Next, we defined the concepts of "information" and "society" individually, and then examined what happens if we join the two terms. What is the result of merging them in a compound term "information(al) society"? Finally, we examined the more prominent social science perspectives that developed in the 1960s and 1970s and explored the process of "informatization" of society.

In regard to the information society we laid out three introductory discourses that may help the layman to formulate essential questions. Since the subject of our interest is often identified with information and communication networks, and primarily with the Internet, our most significant task was to propose that fears and preconceptions may be misleading, and moreover, without any rational basis. Additionally, these might also hinder a better understanding of information society, instead of helping us to get closer to the core of our problem.

We also introduced the alternative namely, the traps which we may fall into by glorifying technology, engendering it with a redeeming, infinite power which is capable of offering a solution to all kinds of difficulties; not to mention the naïve expectation that it will have a universally earthshaking effect.

The third discourse summarised the debate between the technophiles and technophobes. Thus, we drew attention to the tendency to hazard extreme simplifications regarding technology's social impact, especially so, if we depict our future either in the form of a totalitarian state with control being imposed on us, or one in which we experience a world of excessive freedom. We introduced the technorealists' manifesto that offers a kind of "solution" to all these overheated fears and expectations. They urge us to handle technology realistically: as primarily, a means that should be neither glorified nor condemned, yet we must decide how and for what we use it. Yet, this demands that we cannot stay neutral on this issue.

By clarifying the concepts of "information" and "society" we attempted to gain a more profound understanding of the information society proper. We can conclude that the distinguishing feature of the information society lies in its informational character, and in information related processes and phenomena taking their central position in it. Thus we needed to examine what makes this particular society different from those that preceded it since information flow is an indispensable component of every single society.

Social theorists have developed several avenues of scientific research in order to evaluate the novelty of this social formation. Introducing these approaches we collect all potential phenomena that justify the proposition: our era is the age of information, a newly named "informational" age. The most distinctive differences are as follows: the all-pervasive availability of information and communication technologies; the reconfiguration of the occupational structure and of economic production; the revaluation of the information sectors and information related working facilities; the all encompassing growth of networks and globalisation that reduces the necessity for physical space for the first time and, finally, the positioning of culture, especially media culture prominently in the limelight.

The chapter ends with a brief synthesis of the theory put forward by Manuel Castells, the most acknowledged information society scholar. For Castells the new age is characterized by the unifying effect of network systems, primarily in the economy, but similarly for a tension generated by the clash between individual and group identity within the cultural sphere. As a result of this tension, the operation of certain institutions which are indispensable to the collective existence becomes unstable from level of the state to that of the family. This process is restructuring the whole of society while at the same time it ensures our lives are increasingly unpredictable.

REVISION QUESTIONS

1. What basis is there for popular misconceptions concerning the Internet? To what extent are they justified?
2. What visions of the future are presented by the Orwellian or Athenian scenarios for the future politics of the information society?
3. Who are the technophiles and technophobes? How can the technorealists be defined? Which category do you consider you belong to based on your attitude and views on technology?
4. Define the concept of information society in your own words. What would you emphasize primarily? In what sense does this society differ from others that preceded it?

5. What kind of social scientific approaches does Frank Webster distinguish in his research on information society? What reasons do these different approaches give for our lives being embedded in the information society?

BIBLIOGRAPHY

1. Key bibliography

Webster, Frank (1995): *Theories of the Information Society* (Routledge, London and New York)

2. Optional bibliography

Castells, Manuel (1996): *The Information Age: Economy, Society and Culture, Volume I: Rise of the Network Society* (Blackwell, Oxford)
Castells, Manuel (1997): *The Information Age: Economy, Society and Culture, Volume II: Power of Identity* (Blackwell, Oxford)
Castells, Manuel (1998): *The Information Age: Economy, Society and Culture, Volume III: The End of the Millennium* (Blackwell, Oxford)
Toffler, Alvin (1980): *The Third Wave* (William Morrow and Company, New York)

LÁSZLÓ Z. KARVALICS

Information Society – what is it exactly? (The meaning, history and conceptual framework of an expression)

A CONCEPT AND WHAT LIES BEHIND IT

By the turn of the millennium the use of the concept **information society** had already become widespread and was not only an everyday term in the social science vocabulary but was a term preferred by those involved in political planning, political marketing and in the world of business. In addition, it had triumphantly penetrated the language of the written and electronic media. However, it is exactly because of this sudden popularity that the content(s) of the expression has become "diluted", and its use is now laden with contradictions and vagueness. What is more, some overambitious counter concepts have been proposed. If there were a generally accepted interpretation or definition based on the best arguments in the professional and scientific literature of information society, it might be easier to clarify the contentious questions and to restructure the sphere of problems that has become increasingly chaotic. However, there are numerous information society theories stemming from different areas of science built on diverging traditions. Thus, instead of a systematization based on "shared or common codes" there is a constant battle going on between individual and original information society concepts.

The situation is exacerbated further by the concept of the information society having developed separately from the very outset from that empirical Reality which is information society, and when it was finally connected through numerous alternative expressions it was already public ally accepted. This is why **information society studies** became established at a very late stage, just before the turn of the millennium, with one of its first tasks being to carry out a satisfactory "logical systematisation" in regard to the subject explored. All this could be the basis for serious professional discussions and debates and for the result to inform current higher education curricula.

Although this chapter aims to objectively present the most important starting points of this systematization, it is inevitable that because of the lack of accepted criteria ("standards"), in many cases it reflects only the author's own standpoint.

1. Information society – the birth of a concept

The collocation "information society" as it is now used first emerged in Japanese social science(s) in the early 1960s. The Japanese version of the expression *(joho shakai, johoka shakai)* was born during a conversation in 1961 between Kisho Kurokawa, the famous ar-

chitect, and Tudao Umesao, the renowned historian and anthropologist. It debuted in written texts as the title of a study published in January 1964. The author was the aforementioned Jiro Kamishima but the title was given to the study by the editor Michiko Igarashi (Sociology in Information Societies). Three authors are in competition to win the imaginary award for being the first to use the collocation "information society" in their book's title and due to the reconstruction difficulties in regard to the dates of preparation and publication of the manuscripts, it is almost impossible to decide which publication was the first: Yujiro Hayashi's bestseller of 1969 (*Johoka Shakai: Hado No Shakai Kara Sofuto no Shakai e,* The Information Society: From Hard to Soft Society) or the introductory and popularising books by Yoneji Masuda and Konichi Kohyma published in 1968 *(Joho Shakai Nyumon* - Introduction to an Information Society). However, there is no doubt at all that the birth and fast consolidation of the concept is linked inexorably to the island country: as early as 1971 a systematising "dictionary" on information society was published in Japan (*Johoka Shakai Jiten,* Dictionary of Information Societies). The first English language reference dates from 1970 and can also be linked to Yoneji Masuda, who used the expression in his lecture at a conference (it appeared in print in the same year). Of course all of this does not imply that the literature (in English) of the information society does not have even earlier antecedents. It was just that different expressions were used for the newly emerged social-economic entity, namely **post-industrial society** and **white collar revolution**. A common characteristic of these proto-concepts is that they isolated one of the components, i.e. one part, of the rapidly changing economic-social complex and suggested that it was sufficient to describe – in both a descriptive and metaphorical sense – the whole. As a result of this, several dozen terms, each with a different approach, proliferated between 1950 and 1980 and then – in our opinion around 1980 – they merged into a comprehensive, joint umbrella term combining the concept of information and society: this new concept included and encapsulated all the previous partial concepts and even preserved the expressive power, approach and attitude they represented.

The expression "post-industrial society" was coined in 1914 in Great Britain by Ananda K. Coomaraswamy and Arthur J. Penty, and later revived from 1958 in America (primarily by Daniel Bell) and from the end of the 1960s in French social sciences (likewise by Alan Touraine). At the beginning observers used it in a strongly normative (what should it be like?) or strongly predictive (what will it be like?) sense, but a shared presupposition of the authors was the accelerating "decomposition" and transformation of those industrial structures that had developed over a period of some two hundred years. Another aspect of the same structural changes was analysed by the Australian economist Colin Clark, who introduced the concept "the third (tertiary) sector" in 1940, drawing attention to the growing importance of services as opposed to material production (service economy=tertiary sector). In regard to technology, which forms the basis of production, the term "automation" (later "cybernation"), introduced by the automotive engineer of the Ford company D. S. Harder in 1946, facilitated the discussions for decades, and dozens of evocative terms were originated to designate the sweeping changes generated by the hurtling development of information technology, Of these the most well-known were the various manifestations of the computer and the scientific-technological revolution. The term "brain work" replaced "manual work" and opened the way towards the concept of information society. This was identified by the economist Alfred Marshall and the social philosopher and revolutionary Peter Kropotkin at

about the same time, around 1890. For a while the word "intelligentsia" ("intelligence"), which spread in German-speaking areas after 1848 and in Russian-speaking areas after 1860, seemed to be a lucky choice to express the growing importance of those social groups in the labour market that emerged who were using their intellectual performance and knowledge to make a living. However, because of the increasing ideological "interference" connected to the word, the term "white-collar work" spread more widely in the 1950s and it also became an "official" term used to denote a basic category in statistics and employment. At first the term, created by Upton Sinclair in 1919, was used exclusively for office workers and those officials who moved from manufacturing industry towards intellectual work; however, later it was extended to workers who carried out activities requiring certain (mainly high) qualifications. Interestingly, it took a long time for teachers and scientists to "make it" into this category; this happened only at the beginning of the 1960s. Not long after this, the term *knowledge worker* was coined in 1967 by Peter Drucker.

From the end of the 1960s until the beginning of the 1980s it seemed that the term "post-industrial society" would become an umbrella term used to describe the major social transformation that had taken place, but the term became more and more contradictory and vague. On the one hand, the "traditional manufacturing industry based on manual work" was never the same as "industry": it was Fritz Machlup, one of the pioneers of the information society discourse, who, using the language of economics, showed at the beginning of the 1960s that the production of knowledge is an economic activity and could be described with the terms used in the analysis of the industrial sector. He defined a unified *knowledge industry* by organising a structure using more than 30 industries. He reviewed the conceptual field, and then described one of its sectors, the knowledge producing sector, in detail. Finally, he pointed out that the biggest and most important sector of this industry was education. However, due to the increasingly complicated patterns of information, knowledge processes and institutes, other terms became successively unsuitable since they tried to balance the growing complexity of production by including the quaternary and quinary sectors. Neither term, "white-collar" nor "brain work" was able to reflect the process by which knowledge itself was upgraded in the case of each worker and by which traditional industries became increasingly information and knowledge intensive. Furthermore, "post-industriality" had the secondary meaning of "post-capitalist", which presented a problem since the capitalist foundation had not changed in spite of the many fundamental internal realignments concerning mainly the proprietary, power, and welfare dimensions.

In the end the term "information society", which was the umbrella term used to describe the elemental social changes that took place in the second half of the 20th century, remained alone in the ring. But not for long: the term quickly filtered through to the political sphere and the language of the media, and as a result of this it has had to face multiple challenges ever since.

2. Tribulations concerning the etymology of the information society

Because of the latest "wonders" of the ever accelerating technological revolution, and to the media reporting of these wonders, by the mid-nineties, the "acoustics" of the concept of information society were defined by increasingly stronger links with technology, and not by

sociological or sociotheoretical models. For a while, the European Union's political practice interpreted and used the concept in a way that was completely alien to its meaning almost declaring that the liberalization of telecommunications was equal to information society itself. They then, by transposing the hardware-software-internet complex, expanded it to include all the tools of informatics. With this simplifying, restrictive interpretation of the concept of "information society" which is miles from the original meaning, it would be fair to say that in fact it is the essence we have lost. For we should not seek the true dimensions of information society within telecommunications or informatics, but rather in *education, science, innovation, the (new) economy, content and culture.* The "actualisation", or "refreshing" of the concept's usage did not take place on the system level of interpretation, in the course of clarifying discussions, but through verbal partisan warfare. In parallel with "knowledge" appearing more and more often as a relevant context, it seemed appropriate and *justified to connect the surplus meaning to a new expression related to knowledge* (information society contra *knowledge* society, knowledge-based society).

Such is the nature of language, this lively, self-creating system: if it senses in an expression an obstacle between expression and mutual understanding, it immediately creates a "rival" that flows into the communal field or area of language use, and creates a course of its own in everyday communication. Conceptual multiplication can in fact be *considered as an attempt to return to the originally complex, paradigmatic, holistic interpretation of the concept of "information society".* The trouble is that this change was not based on reflection related to awareness, deliberation, choice and arguments, but rather the slowly interweaving, independent behaviour of "verbal innovative centres" that pointed in the same direction. For this reason, the basic question could not be solved: *the interpretations remained arbitrary, people continued to give unique meanings to each expression.*

What is more, the situation became even worse, for behind the banal change of function of meanings, supposedly scientifically based explanations of an ideological nature started to appear, "deducing" why and to what extent *knowledge-based society* or *knowledge-society* was worth more than *information society*. The question is thus degraded to the level of trench warfare: someone says the definition of information society is such and such (using the expressions "information processes" and "information technologies" as often as possible), then goes on to show us how much deeper and more subtle the picture is if we talk about knowledge processes and knowledge technologies, consequently, the expression *knowledge society* designates a more "progressive" state than *information society.* Moreover, this polemic literature is not even consistent. Some say that *information society is one of the components of knowledge society,* which is not at all surprising, since *information* is one of the constituent parts of knowledge. Others are of the opinion that *knowledge society will take the place of or "overwrite" information society* as an outdated term. And the debate drags on; *each statement can be traced back to how the concept of information society is watered down/weakened*. Despite the antecedents of specialized literature and the previous contexts, the terminus technicus *information society* is continuously becoming weaker, and the scientific community, whose members study the science of information society are yet to come terms with this fact.

3. Information and knowledge – transcending an artificial separation

This unproductive, contradictory and incoherent state was able to develop because the concepts of information and knowledge were quite ambiguous from the start. In other words: no criteria from the social sciences of information and knowledge were developed whereby contemporary socio-theoretical studies could be made with the help of clear conceptual tools. There is a mathematical-statistical theory of information which is insensitive to the dimensions of quality, and cannot transmit operational work-concepts to the social sciences. With reference to the concept of information in the case of library and documentation science, it is only valid for a restricted problem-area. The sociology of knowledge or the methods of the cognitive sciences are only sensitive to certain questions regarding the phenomenon of information or that of knowledge, and do not strive to create a general theory of information or knowledge.

Even the "classic" texts of information society can be blamed for treating the question superficially, without offering a solution. Those who are interested in the nature of "information" have done a lot more than those who elegantly avoid thinking about the basic category, or deal with it by plagiarizing a useless Shannon-Weaver formula. Fritz Machlup and Daniel Bell are aware that, within the framework of system analysis and cybernetics created mainly by Norbert Wiener, the meaning of information and knowledge should be clarified, and they do indeed take a few steps in that direction. In 1962 the economist Machlup pointed out that it is redundant to talk about knowledge *and* information; in fact, we are talking about the same quality. At a later stage he became one of the initiators of that inter-disciplinary movement which, from the second half of the sixties, endeavoured to create a "general information theory". Daniel Bell, however, caused quite a lot of harm by interpreting the relationship between information and knowledge, on the basis of some philosophical, logical, or epistemological and knowledge-based sociological readings in a superficial and limited way thereby categorically refusing to use the concept of information society.

The group of phenomena comprising higher psychic functions, the nervous system, consciousness and the functioning of the mind can be described by a complexity-continuum. We are talking about an unbelievably large and complex universe of closely related, intertwining operations and objects, patterns and models. Squeezing all this into one of the extremely simplifying pseudo-models actually leads us further away from getting to know the real structures and natures. How can one possibly believe that with the duality of "information" and "knowledge", and perhaps "wisdom" as the third, one has understood and written down anything concerning this incredibly complex system? Although the "general social science of information" has not yet come into being, some of its preliminary axioms can already be articulated efficiently.

- The processes of information production take place in the minds of individuals, not in natural or artificially maintained "exterior" locations (this immediately places the investigation of the flow of information into a "human" and "social" frame, while technology becomes a secondary consideration).
- The systems of information technology operate with information converted into symbols, computers and machines process symbols, minds and intellects process information.
- Knowledge can be defined as further transformed or contextualised information.

When we talk about information and knowledge, we are talking about two indivisible components of a single, unified, cognitive universe. When we talk about the information society, we are condensing into the territory or range of the concept's interpretation all the meanings and connections that appear undivided in the clusters of expressions related to the processes of information and knowledge.

We can get closer to the essence of the information society by examining its components instead of using extremely concise definitions.

DEFINING THE INFORMATION SOCIETY

In the case of a highly abstract concept such as the information society short definitions may emphasize completely different aspects while one of the dimensions of the group of phenomena of information and knowledge is the central element of organisation. We have chosen the following definitions from among fifty others:

- A society that organises itself around knowledge in the interest of social control, and the management of innovation and change... *(Daniel Bell)*
- A new type of society, where the possession of information (and not material wealth) is the driving force behind its transformation and development […] (and where) human intellectual creativity flourishes. *(Yoneji Masuda)*
- The information society is an economic reality and not simply a mental abstraction ...The slow spread/dissemination of information ends […] new activities, operations and products gradually come to light. *(John Naisbitt)*
- A society where […] information is used as an economic resource, the community harnesses/exploits it, and behind it all an industry develops which produces the necessary information ... *(Nick Moore)*
- A social structure based on the free creation, distribution, access and use of information and knowledge […] the globalisation of various fields of life. *((Hungarian) National Strategy of Informatics, 1995)*
- A new type of society in which humanity has the opportunity to lead a new way of life, to have a higher standard of living, accomplish better work, and to play a better role in society thanks to the global use of information and telecommunication technologies." *(Béla Murányi)*

It is evident that the definitions are based on hidden preconceptions regarding which areas of life change significantly: some are centred around resources, others around products, or industries, or activities, or society and people. Some consider the representation of global dimensions extremely important, while others do not. Some are of the opinion that political dimensions (control) are basic, others do not even mention it. All this points in the direction that in order to reveal the content of the concept, one must explore all the possible points for examination of conduct and employ multi-dimensional analyses.

1. Models instead of definitions

We shall now introduce three "classical" divisions, then propose a more complete, synthetic model.

In his "high-definition" analysis, which, to this day, is the most often quoted analysis of information society, Daniel Bell surveys the characteristic differences reflected by the social-historical phases – simplified into three main periods – along nine distinctive aspects. These are as follows: *Economic sector, resources bringing about change, strategic resources, technology, knowledge-base, methodology, time perspective, planning, guiding principle.*

1. Table. Dimensions of the information society according to Daniel Bell

	Pre-industrial	Industrial	Post-industrial
Mode of Production	Extractive	Fabrication	Processing; Recycling
Economic sector	Primary Agriculture Mining Fishing Timber Oil and gas	**Secondary** Goods producing Manufacturing Durable products Non-durable products Construction industry	Services TertiaryQuaternary Transportation Trade UtilitiesFinance Insurance **Quinary**Real estate Health, education, research, government, recreation
Transforming resource	Natural power wind, water, draft animals, human muscle	**Created energy** Electricity – oil, gas, coal, nuclear power	**Information** Computer and data-transmission systems
Strategic resource	Raw materials	Financial capital	Knowledge
Technology	Craft	Machine technology	Intellectual technology
Skill base	Artisan, manual worker, farmer	Engineer, semi-skilled worker	Scientist, technical and professional occupations
Methodology	Common sense, trial and error; experience	Empiricism, experimentation	Abstract theories, models, simulations, decision theory, system analysis
Time perspective	Orientation to the past	Ad hoc adaptiveness, experimentation	Future orientation: forecasting and planning
Design	Game against nature	Game against fabricated future	Game between futures
Axial principle	Traditionalism	Economic growth	Codification of theoretical knowledge

Source: Bell, 1979

The three great periods correspond to those defined in the The Third Wave (1980) by Alvin Toffler (the most widely read book about information society, translated into more languages than any other work) and – applied to a time axis – they are perfectly identical with the typology used by Tadao Umesao, who divided the economy into *endodermal* (agriculture, fishing), *mesodermal* (transportation, heavy industry) and *ectodermal* (information, communication, training) sectors.

2. Table. Comparison of the characteristics of the industrial and information society by Yoneji Masuda

		industrial society	information society
Innovational Technology	Core	Steam engine (power)	Computer (memory, computation, control)
	Basic function	Replacement, amplification of physical labour	Replacement, amplification of mental labour
	Productive Power	Material productive power (increase in per capita production)	Information productive power (increase optimal action-selection of capabilities)
Socio-economic structure	Products	Useful goods and services	Information, technology
	Production centre	Modern factory (machinery, equipment)	Information utility (information networks, data banks)
	Market	New world, colonies, consumer purchasing power	Increase in knowledge frontiers, information space
	Leading industries	Manufacturing industries (machinery industry, chemical industry)	Intellectual industries, (information industry, knowledge industry)
	Industrial structure	Primary, secondary, tertiary industries	Matrix industrial structure (primary, secondary, tertiary, quaternary/systems industries)
	Economic Structure	Commodity economy (division of labour, separation of production and consumption)	Synergetic economy (joint production and shared utilization
	Socio-economic principle	Law of price (equilibrium of supply and demand)	Law of goals (principle of synergetic feed forward)
	Socio-economic subject	Enterprise (private enterprise, public enterprise, third sector)	Voluntary communities (local and informational communities)
	Socio-economic system	Private ownership of capital, free competition, profit maximization	Infrastructure principle of synergy, precedence of social benefit
	From of society	Class society (centralized power, classes, control)	Functional society (multicentre, function, autonomy)
	National goal	GNW (gross national welfare)	GNS (gross national satisfaction)
	Form of government	Parliamentary democracy	Participatory democracy
	Force of social change	Labour movements, strikes	Citizens' movements, litigation
	Social problems	Unemployment, war, fascism	Future shock, terror, invasion of privacy
	Most advanced stage	High mass consumption	High mass knowledge creation
Values	Value standards	Material values (satisfaction of physiological needs)	Time-value (satisfaction of goal achievement needs)
	Ethical standards	Fundamental human rights, humanity	Self-discipline, social contribution
	Spirit of the times	Renaissance (human liberation)	Globalise (symbiosis of man and nature)

Source: Masuda, 1980

In contrast to Masuda, Schement and Curtis reduce the "essential components" to six categories. The categories related to goods, industry and work incorporate a number of the already known possible elements but entirely new ones, such as interconnectedness, media environment and community, also appear in their work and are even represented as being equal to goods, industry and work.

3. Table. The six characteristic and determining components of information society by Schement and Curtis

Category	"Content" behind the category
Information commodities	market- and commercial processes related to their production
Information industry	industries built on the large-scale manufacturing, production, distribution and consumption of information in an increasingly global competitive arena, where information export is the measure of economic *fitness*
Information work	traditional employment indicators are gradually shifting towards more employers (and professions) dealing with information due to the nature of the work involved
Interconnectedness	increasing social complexity and labour distribution are realised through increasingly indispensable technological support systems, while technology facilitates the emergence of secondary networks in addition to the traditional (primary) ones
Parallel use of several media	the cohesive power of communities of increasing size, independent of the debates surrounding the disfunctions of the (new) media
Interaction of technological and social progress)	Strengthening of new community formulae versus traditional (economic, scientific (!) and political) elites.

Source: Schement, J. R. – Curtis, T., 1997

At the end of the overview of examination criteria comes a synthetic table which partly improves the previous models and partly specifies them. This table includes formulations to make individual elements measurable and thus answers the question of from which point and to what extent of deviation from absolute or relative indicators can a society be regarded as an information society. That is, where is the tipping point from one state to another in a sub-system or in regard to a characteristic, and through this, of all society. The same table will demonstrate that in many cases it is typical of metaphors found in book titles to focus only on particular limited areas. Returning to the idea proposed in the introduction, we should restate that the term information society is not a "rival" of these terms (see Metaphor column below) but an umbrella term incorporating them all.

4. Table. Synthetic basic categories of information society, their measurability and metaphors

Basic category	**Measure and "tipping point"**	Metaphor
Production (Manufacturing)	The proportion of businesses forming part of the information sector and producing information and knowledge products in relation to other sectors (relative dominance: when it is the largest sector; absolute dominance: when the sector alone produces over 50%, i.e. it is larger than all the others put together).	*information industry, knowledge industry, information and knowledge industry, information economy, knowledge economy, knowledge-based economy*
Employment	The number and proportion of those employed in the information and knowledge sectors in relation to other sectors (relative dominance: when it is the largest sector; absolute dominance: when the sector alone produces over 50%, i.e. it is larger than all the others put together).	*white-collar workers, information and knowledge workers, immaterial workers, knowledge class* intelligentsia
Work	How many people and to what degree are engaged in information activity "as a profession" according to the type of work done (threshold level: 50%).	*symbol manipulators (Reich, 1991), intelligence, brainworker/mind worker*
Resource and technology	Information and knowledge appear as resources and forms of capital in addition to traditional forms – the theory of growth and accounting strive to mathematise this but so far there are no accepted algorithms. (However, the contribution of information and knowledge technology to growth is already measured.)	*intellectual capital, human capital, information capital, corporate information and knowledge assets*
Income and wealth	GNP on a national level, monthly income on an individual level. There are no accepted measures in regard to the amounts; what is more, these amounts vary depending on the time of joining the information society. $5,000/person/month was the threshold level at the turn of the 1960s in the USA.	*affluence, welfare state*
Consumption	The proportion of purchased information and cultural goods, means and services in the consumer basket, especially in regard to media contents (threshold level: 33%).	*consumer society, prosumers, mediatised society*
Education (level of education)	Proportion of those with a qualification earned in higher education (degree holders) in society (threshold level: 50%).	*learning society, meritocracy*
Cognition	Results and scales in the measurable dimensions of cognition; microscopic dimensions, astronomical distances and scales, discovered genocombinations, sign processing, etc. The scale to measure this is still to be worked out.	*life-long learning, scientific revolution, nano-scale, peta-scale*
Conflict management method and power technique	Replacement of traditional forms of warfare, placing economic conflicts into an information context (business intelligence, innovation competition). The "state of democracy" of society, types and mediators of control. There are some methods used to measure the "degree" of democracy.	*information warfare, cyber wars, business intelligence, bureaurocracy, control crisis- and revolution, risk society*

Basic category	Measure and "tipping point"	Metaphor
Inter-connected-ness	The degree of mutual connectedness (objective in the case of telephone networks: provision over 50%).	*telematic society, "wired society"*
Worldview and logical framework	Has the static and energy-centred worldview been replaced by an information-centred one? Have the global system level and the "space age" become a framework for analysis and interpretation? Is orientation to the future a characteristic feature?	*global village, technoculture, information civilisation*

Source: Z. Karvalics, 2007

Based on the above described criteria, the subsequent parts of this chapter will explore the emergence of information society as to its rhythm, means, time, environment and specific characteristics.

2. The historical background of information society

Misunderstandings and distortions related to information society sap the power of the term by constantly placing its dawn or arrival somewhere in the distant future and thus we create and maintain a feeling of "transition". Alternatively, some do the exact opposite and try to prove that an information society existed as early as the late 19th century (more recently some even suggest the late 18th century), while some others go as far as to question the viability of the term by saying that "information" and "knowledge" have always played an important role in history. However, information society is to be understood as a strongly historical notion, in a chronological order: it refers to a social condition (quality) which a given society can claim to have "attained" by taking various criteria into consideration as opposed to the prior stage of development it had achieved.

There is no consensus in literature in regard to when individual countries "entered" information society and what variables should be examined. Interestingly, few scholars take a clear stand on this question and even if they do, they do so very rarely. Alvin Toffler and John Naisbitt insist that for the United States the "tipping point" into information society was in the late 1950s. Others date this from the late 1960s. However, if the easily measurable criteria of Table 4 (production, employment, work, level of education, interconnectedness) are used, a "rhythm" is taking shape, of the "third wave" taking its course across the Globe. This is despite the inconsistencies of retrospective data queues enabling a rough estimation – lacking rigorous and accurate calculation.

Naturally, after the dominance requirements were satisfied *the developed countries of the world gradually became "information societies"* and their development continued after this but with new indicators; e.g. the number of telephones was then the best measure of interconnectedness, while today the basic indicators for this are mobile-phone and internet usage.

According to a tentative assessment, the United States became an information society in the early 1960s, with Japan joining ten to fifteen years later and the pioneering countries at the end of the 1970s, with other fast developing countries (primarily Asia's four little tigers) attaining the same at the beginning of the 1990s. In the case of countries that joined the EU at

a later stage, among them Hungary, this entry dates from around the millennium. A great part of Africa, Asia and Latin America cannot be regarded as information societies. One of the characteristics of the Information Age is that pre-industrial, industrial and information societies live side by side. A "global information society", despite the stark inequalities, will become a reality when the high indicators of the most developed countries will balance the rising yet still low indicators of the other countries. This process is similar to the process whereby in some countries the changes that first appeared in the most developed urban environment, i.e. the most urbanised regions, slowly spread to the less developed, typically rural, regions.

In the United States, for example, based on its indicators, the capital and its environs *(Greater Washington Area)* were regarded as an information society as early as the 1950s. Within a few years, the New York-Boston axis attained the same status, and by 1955 the entire east coast, the "Megapolis" and California, as well as the Great Lakes mega region joined. Based on national indicators it could be claimed that at around 1960 the United States, which is the size of a continent, had become an information society. City states (for example Singapore and Hong Kong), smaller island countries (such as Taiwan and Ireland) and the "small states" (such as Finland, Slovenia and Estonia), where the internal penetration time is "minimal", became information societies incredibly fast, and of course some "super-urbanised" cities showed signs of the information society long before the entire country did (such as Stockholm in the early 1960s).

If a single "emblematic" year denoting the "beginning" of the information society is to be specified for future history textbooks, it should be 1961. This was the year when the main economic indicators in the United States "tipped over", and when the prototype of the computer network which forms the technological "tissue" of information society was built. This was the time when humanity entered the space age and embarked upon signal transmission via satellite, and finally, as mentioned beforehand, the term "information society" was coined.

There are – rather tentative – estimations about the birth of global information society: the tipping point in this case is expected around 2018–2020. It is also certain that countries that have undergone or are undergoing significant changes after having attained the state of information society were and are able to considerably improve their indicators and this more advanced stage could be termed **"developed/advanced information society"** (with a dominance rate expected around 66-75%, as opposed to 50% plus).

Let us look beyond numbers and see how theories have taken shape.

THE THEORY OF INFORMATION SOCIETY IN OPERATION

Information society literature distinguishes three interrelated, yet in their essence, distinct problem areas depending on the level of abstraction in the approach taken by an author when studying a subject, as well as in the complexity with which they present this subject and the depths they choose to explore.

1. Three information society narratives

The "great narrative" – the civilisation theory as context – analysis at the macro level

Numerous well-known theories have emerged out of the intertwining of *historical sociology, social philosophy and culture theory,* operating with more and more daring categories as information society is advancing. The most comprehensive domain for exploration is designated the "civilisation theory" level.

The early literature written about information society by the Japanese Tadao Umesao, the Canadian Marshall McLuhan and the American Alvin Toffler took this approach when they studied information society in order to formulate a coherent system. It is undoubtedly the information-based civilisation theory of the Japanese Shumpei Kumon that represents the most daring intellectual quest in the subject.

The civilisation theory approach takes the entire discipline of social history as its subject matter: presenting the information society in this context as fundamentally the end product of an intellectual process and not its actual subject. When the time came for the idea of "paradigm change" to be introduced into the public discourse, it was world history and analyses embracing periods of hundreds of years that provided the terminological toolkit to precisely and tangibly describe the depth, dimensions, scale, significance and evolutionary pattern of the ongoing processes. Since it has been accepted that this change is really taking place, the horizon and the time axis have become narrower but the questions posed by authors are those most socially comprehensive. For example, how do techniques of community organisation and co-ordination replace each other and change? How does the human psyche change? How are mechanisms of economic and political control transformed and what impact does this have on the environment and the relationship between man and nature?

The "small narrative" – development theory as context – the meso level

There is no doubt that Manuel Castells' applauded trilogy *The Information Age* is the high point in the use of that small narrative genre up to now. The strivings of leading economic researchers, sociologists and political scientists to chart the most important structural principles and transformational logic since the 1960s reaches its zenith with this work. Distinctively, Castells manages to surpass traditional reasoning by offering a compact and multilayered foundation linking *economic-and political, as well as cultural theory.* He has provided thus far, the most complete empirical embedding (with volumes of data queues) and at the same time created a unified terminological framework by the consistent application of the principle of the "network" for the study of the new set of social phenomena pertaining to the information society. After Castells, no matter how excellent they may be, "single-viewpoint" approaches seem jaded and lacking.

Thus, there is a fount of exciting issues below the civilisation theory system level, too. Dozens of new and fundamental phenomena can be found in the small narrative, their shared feature being that they all operate on a highly abstracted level when discussing issues of transformation in individual social subsystems; the network economy, new social and community phenomena, the generation of the digital era, characteristics of the new means and

media environment, the power and communication pattern of the new world order, the rise of cyber science. These issues are related to various prominent "problem groups"; there are the issues pertaining to information inequalities, most often discussed in the form of analyses of the digital divide; there are the complex set of questions related to information literacy, which touch upon important disciplines ranging from pedagogy to psychology; there is the multidisciplinary interpretation of the information games between citizens and authority; as well as the legal and legal-philosophical problems generated by production and consumption of intellectual goods.

In addition to the above, the small narrative responds sensitively to the dynamics and structural transformations in already existing information societies. It addresses questions such as what stages, models and types exist within information society development and what rules it is governed by. What new information does the study of information society produce? How could the new and comprehensive individual "paradigms" be best captured? (For example, by introducing expressions such as *ambient intelligence* used to denote the universal environment of means and transactions, by a diverse analysis of the "virtual" dimensions of reality, or by exploring the internet phenomenon using a comprehensive and complex social science approach.)

The "mini narrative" – praxis and reflection – micro level

The predominant majority of mini narrative texts are produced in workshops and by authors who explore certain smaller slices of reality that are significant for practical considerations, while typically looking for answers to challenges in their own discipline or having found a location for their discussions in the digital context.

Since the means and institutions network built around information and communication technologies – from mobile telephony and internet service providers, information desks at railway stations to libraries and archives – interpenetrates every area as an "application", every "meeting point" becomes a theme giving rise to a whole range of tasks to be discussed and researched along the lines of fact finding, information proliferation and contextualisation.

The practical aspect of the mini narrative reveals itself in its purest form where direct intervention is a prerequisite for finding new information. In the case of economic players this means product development and innovation. In the public sphere it appears as *information strategy,* that is, information-conscious political planning as a new practice of social and economic control focusing on issues pertaining to information society. Information strategies, that is, programmes aimed at building the information society, added a series of contextual sciences into their own arsenal, and as a result of this freedom of *information* and *information privacy* have gained greater importance than before.

Narratives embedded into one another

The narratives and abstraction levels naturally are not clearly separate from one another. It is especially exciting to unravel how experiences on the micro level help in the formulation of more comprehensive theories, and the way a given "great narrative" starting point funda-

mentally determines the approach taken when analysing an everyday phenomenon. The interrelatedness between the narratives is always present and offers many challenging issues. Let us look at three concrete examples to demonstrate how this works.

Analysing the smiley language (little icons used to add colour to written communication) is a popular topic in the mini narrative posing no real professional challenges which is similar to the linguistic study of network jargon. However, issues related to changes in written communication and in the acquisition of language and writing are topics be researched on a higher, meso level. Furthermore, issues such as the linguistic diversity of the internet age and the dilemmas of *lingua franca* in a globalising world are topics of research on a civilisation theory level.

Another example could be the examination of money. This fundamental element of the economy can be studied from the "bottom", too. The technological, criminal, banking industry and psychological issues related to credit card fraud are typically in the realm of the mini narrative. However, the examination of how the appearance of electronic money restructures the money and information flow in the economy takes the researcher to a higher level of complexity, that of the meso level. Moreover, a civilisational aspect opens up when exploring the issue of whether the historically emerged form of money, which is the information medium of measuring transactions between various economic players, will disappear due to the emergence of new, "more advanced" forms of mediation thus eliminating several harmful disfunctions of the former. Another question that can be raised at this level may be: will the shortening of the information value chain between the producer and consumer challenge the laws that have been strictly regulating the operation of the economy for thousands of years?

Finally, let us take the example of urban space. The IT system of a local government, a newly launched electronic bus ticket or their surveillance cameras raise questions on a micro level, as do political programmes aimed at the building of an "intelligent city". However, the same problems can be approached on a different level: issues such as information models determining processing that govern a city's operation, the construction and use of network structures, the reorganisation of spaces made available as a result of "deindustrialisation" and issues of post-industrial urban planning have a strongly "small narrative" character. The "great narrative" can also be applied here when we make an attempt to describe the process of information society development in the context of urbanisation, and when we explore the dynamics of the further development of global settlement networks; that is, the planetary size "super city", the Antropopolis, and the decentralisation process resulting in the "rediscovery" of rural areas.

2. Social informatics and information society

In agreement with Alistair Duff, we regard analysis of information society at the civilisation theory level to be the "classical" great narrative for information society, and *social informatics* to be the scientific area where the observation takes place on meso and micro levels.

Several terms have been coined in the last forty years to delineate the area of interdisciplinary research and knowledge into the social issues pertaining to telecommunication and computing. The English *(computers and society, social impacts of computing, social issues of computing and social analysis of computing)* and French *(l'informatization de société)* expressions used to name this area have become widely known. However, there is still no commonly accepted single term used in scientific taxonomy. Rob Kling, the recently de-

ceased pre-eminent scientist and research organiser, claims that since 1996 the term *social informatics* has been accepted by the scientific community as representative of a cross section of the aforementioned expressions, but it is actually not the case. Indiana University, where Kling worked (as well as some other departments on the North American continent that emulated IU's idea) presents a possible approach. However, the institutions of higher education and research institutes across the world apply the most diverse terms and thematics when they explore the social issues arising from information technology.

Accordingly, this text agrees that "social informatics" is accepted by the professional community as a complementary term for "information society" which falls in the scientific realm of the micro and meso levels. Until this terminological clarification is finalised, it is our contention that the expression "social informatics" can be best used in courses of higher education. The acute problems of informatics can only be addressed and described by applying a comprehensive approach that incorporates issues from the social sciences. Therefore, the expected outcome of social informatics courses is for students to master such an approach and a corresponding way of thinking, and to acquire the skill to find their way in the jungle of challenges and through the vast number of themes. To achieve this, it is essential to provide students with an adequate basis in social science knowledge and terminology, as well as the skill to detect trends. Students should also be able to take a position in strategic political discussions on informatics as well as argue a critical stance on issues and in the various debates related to the Information Age.

3. Vital issues of information society

In light of what we have said above we share the view that the essential issues of information society should be studied in the context of civilisation theory. This means that all civilisation issues that generate discourse are *par exellence* regarded as issues of information society, since they come into being in the context of today's information societies. This is reflected by the collocations typically used in information society literature.

- The concept and issues of the *global information society* address all the significant components of the supranational system of organisation. In fact, there are a great number of problems that were raised independently of one another, but primarily those of identity, international communication, international organisations, the "world wide web", supranational regulation, migration processes, multiculturalism and global knowledge management are comprehended in this discourse.
- The concept of the *sustainable information society* raises long standing problems of the environment and natural resources, with social innovation and action planning determining the future development of the information society by providing normative viewpoints with regard to sustainability. In certain cases the demand for "green information society" arises.
- The umbrella term *the safety of the information society* comprehends many problem areas ranging from the issue of society becoming "fragile" as a result of being at the mercy of technology, through questions of the preservation and preservability of the accumulated knowledge of mankind to the anthropogenic threats our civilisation is exposed to. Ulrich Beck's famous term risk society was coined in response to these problems.

- The expression "space-oriented information society signifies that the dynamics and direction of pan-human activity point more and more markedly beyond the Earth's confines. What is more, the history of information society has manifold connections with space research, since its beginnings overlap with satellite information transmission, an important technological solution enabling the emergence of the information society, while today's high-tech achievements in remote manipulation, data transmission and astronomy aptly reflect the inquisitive nature and the dynamics of information society.
- The *electronic Orwellian world versus digital Athens* debate questions what direction the new information means will take the relationship between authority and the citizen. Will the world shift towards the "brave new world" of being observed and controlled or towards a new democracy of digital agoras?
- The concept *intelligent city* signals the translation of information society onto settlement level reminding us that urbanisation played a significant part in the emergence of information society.
- The *Corpus Digitale* discourse raises the issues pertaining to the recording, preservation and access to pan-human knowledge.
- The expression *creative information society* is used to refer to mass proliferation in the skill of producing original knowledge. This is presented in the business literature as productivity while others regard it as generating an employment revolution for the individual. The birth of a "creative class", as Richard Florida (2002) calls it
- The concept *post-information society,* which emerged in recent years, has proposed numerous future scenarios to describe possible futures surpassing the current institutions and technologies; biotechnological revolution, new generation of artificial intelligence, visions of the fusion of man and machine into functional systems.

SUMMARY

"Information society" is a term used to describe the most recent stage of social history. In the 20th century the most developed countries gradually entered the state of information society and it is expected that within a matter of a few decades the majority of the world's population will be living and working in a global information society.

Although the concept came into being around the same time as the new social formation, it gained wide recognition and acceptance only from the early 1980s, by which time there were competing attempts to establish "proto-concepts" to denote the new paradigm that was emerging at the time. Then, suddenly, a struggle started to counter emerging "counter concepts" and oppose the tendency to apply the term information society in a limited way merely in the context of information technology. The opposition intended that the concept would regain its original, holistic meaning, applied in the context of civilisation theory. Efforts to achieve this may also be seen in information society studies that emerged in the second half of the 1990s, aided by social informatics, which deals with the analysis of micro and meso level phenomena as well as social issues pertaining to information and knowledge technology.

It is not definitions that will reveal the genuine meaning of information society but comprehensive analyses extending to all sub-systems. In this way we will be able to measure when a country "switches" from an earlier state into the "information society". Three levels

of taxonomy ("great narrative", "small narrative" and "mini narrative") provide the framework for the literature of information society with the most fundamental challenges emerging at the level of analysis of civilisation theory issues.

REVISION QUESTIONS

1. List the proto-concepts of information society and explain why an umbrella term needed to be introduced.
2. Where and when did the concept of information society come into being? How did its meaning become more narrowly focussed at a later stage?
3. In which "sub-systems" does the emergence of the information society seem most measurable?
4. Demonstrate how the interrelated micro, meso, and macro-level discourses of information society are built up. Use examples other than those presented in this chapter.
5. Add some more vital issues of information society to the examples listed in this chapter.

BIBLIOGRAPHY

1. Key bibliography

Masuda, Yoneji (1980): *The Information Society as Post-Industrial Society* (The World Future Society, Tokyo, IIS, Washington D. C.)

Toffler, Alvin (1980): *The Third Wave* (William Morrow and Company, New York)

2. Optional bibliography

Bell, Daniel (1976): *The Coming of Post-Industrial Society: a Venture in Social Forecasting* (Basic Books, New York)

Bell, Daniel (1980): The Social Framework of the Information Society (in: Forester, T. (ed): The *Microelectronics Revolution: The Complete Guide to the New Technology and Its Impact on Society MIT Press,* Cambridge, Mass.)

Beniger, James R. (1986): *The Control Revolution. Technological and Economic Origins of the Information Society* (Harvard University Press)

Castells, Manuel (1996): *Information Age: Economy, Society and Culture, Volume I: The Rise of the Network Society* (Blackwell, Oxford)

Castells, Manuel (1997): *Information Age: Economy, Society and Culture, Volume II: The Power of Identity* (Blackwell, Oxford)

Castells, Manuel (1998): T*he Information Age: Economy, Society and Culture, Volume III: The End of the Millennium* (Blackwell, Oxford)

Duff, Alistair S. (2000): *Information Society Studies* (Routledge Research in Information Technology and Society, Routledge)

Mattelart, Armand (2001): *Histoire de la Société de l'Information* (La Découverte, Paris)

ATTILA KINCSEI

Technology and society in the information age

INTRODUCTION

1. Judging technology

Before discussing our main topic, the interaction between technology and society[1], some mention should be made about certain cultural and ideological tendencies in the history of Europe that have affected not only social attitudes towards technology but have conditioned scientific understanding as well. Since the industrial revolution the notion of technology has been burdened with moral values and often extreme views in European societies: it has been regarded as an omnipotent solution to social problems, and on the other hand as a diabolic invention destined to alienate humans from themselves and nature. The basic question of "whether technology is good or bad" has not changed since the Luddite movements in the early 19th century through the romantic spirit of a "return to nature", the futurists' love for technology at the beginning of the 20th century culminating in today's radical environmentalist movements. The prevailing values of every age have stamped themselves on technology like layers of meanings each of which can be found in the **technophile** or **technophobe** approaches to understanding information and communication technology (ICT).

The most obvious feature of information society – even to the man and woman in the street – is the ever-growing number, variety and complexity of technological instruments and their constant change at an unprecedented scale and at a barely manageable pace. The need – and sometimes the pressure – to adapt to this rapidly changing technology in more and more areas of our everyday lives often ends up in frustration and shock for individuals and in moral panic for society as a whole.

When the real negative effects of technological change surface, it is primarily "machines" (PCs, mobile phones, the Internet, etc.) that come to be seen as scapegoats by the public and the mass media alike exaggerating their contribution to the problem and forgetting their positive effects.

However, it is a fact that new technologies – and transformed versions of the earlier ones – play an active role in disrupting our conventional, that is, modern, values and way of life, leading to a sense of helplessness and indisposition in addition to challenging the abilities of individuals and the society as a whole to learn and to adapt.

[1] We mean society in its broadest – that is sociological – sense, of which culture, economy, politics, etc. are all subsystems.

The following chapter tries, from the perspective of **technorealism** (keeping a distance from the value-burdened extremes of **technophilia** and **technophobia**), to point out that technology is not a self-propelled monster unleashed into society to which one has no other choice than to adjust to, but is rather a social construct which – beside transforming our lives – is also shaped by society. Our introductory train of thought ends with Kranzberg's first law of technology which states: „Technology is neither good nor bad; nor is it neutral." (Kranzberg, 1985: 50). It is like us.

2. The scientific approach of the chapter

Studies considering science and technology as an inseparable and organic part of society – like information society studies – do not have a unified conceptional and methodological apparatus, nor a comprehensive and prevailing scientific paradigm. We can talk about a variety of multidisciplinary and interdisciplinary studies, schools, theories and approaches interacting with each other and comprising works of scholars from various traditional sciences like history, economics, sociology or anthropology. The great number of diverse approaches makes it impossible to review them completely, so we have to forget about introducing schools like the technology theories of evolutionary economics in detail. On the whole, the goal of this chapter can be nothing more than to provide an "intellectual crutch" for discussing and interpreting information communication technologies by reviewing the most relevant and important theories, concepts, models and notions of the topic.

To close our introduction and to open the discussion, we argue that theories focusing on the processes of information, knowledge and communication (like information and communication studies, information systems literature or social informatics) cannot claim full understanding of information society without taking into consideration the results of studies exploring the intermingling nature of technology and society.

TECHNOLOGICAL DETERMINISM

The idea of **technological determinism** appeared in the latter half of the 19th century and has been a prevailing popular sentiment ever since, moreover numerous works of scientific importance also bear its marks. Its existence has significantly contributed to the endurance of some technology related misunderstanding.

Technological determinism argues that technology is the principal driving force of society determining its mode of operation, development, course of history, structure and values in a decisive manner. Converse effects are taken into account to a limited extent, fully disregarded or disclaimed. Technological development is thought to be propelled by the logic of science alone.

Most scientific concepts explicitly reject technological determinism; yet they assist its survival by studying only technology's influence on society. This is more symptomatic of ICT related researches. In this chapter we have therefore focused on theories examining society's impact on technology or the interaction of the two domains. The only exception we make is Everett M. Rogers' theory on the diffusion of innovations, which complements these approaches and shows a significant conceptual affinity to them.

DIFFUSION OF INNOVATION THEORY

Innovation has become a key activity of information societies. It is the cornerstone of economic competitiveness. National and regional (such as European) administrations develop high level strategies to promote innovative activities in the economy.

Innovation can be defined as basically novel inventions or concepts – arising from either professional research or ideas by amateurs – translated into practice. An innovation can be a technological object, a new organisational solution or an idea.

Innovations become market goods through product development and/or technology transfer. The product cycle consists of the following stages: introduction (to the market), growth, maturity and stabilization, and decline. The life cycle of common goods (e.g. road infrastructure) and public goods (e.g. public safety) go through the same stages. Rogers' theory applies to the life cycle of innovations as far as the maturity phase and at the level of communities and societies.

Rogers (1995)[2] explains the diffusion of innovations[3] as basically communicative: diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (ibid, p. 20). Diffusion is determined by the above mentioned four factors (innovation, communication channels, time and social systems). It is a process of decision making, in the stages of which different types of information and knowledge transferring mechanisms play crucial roles. The diffusion of innovations – thus, of technologies too – takes place within social networks, so called **diffusion networks**. The ability of individuals to adapt depends on the cohesion of these networks, in other words, to the extent of its homophily (similar socio-economic status, qualifications, attitudes); on structural equivalence (on the individual's position in the network); and on the threshold of other users which makes it worthwhile for a group member to adopt the given technology.

Innovators play a crucial role in diffusing an innovation between homophile diffusion networks. They tend to use the technology first, and usually possess heterophile social relations (they maintain regular relationships with several social groups and through them, several networks of diffusion). Chronologically, the second group to adopt an innovation are called the early adopters; these are followed by the early majority, then the late majority, and lastly, the laggards. Each of these ideal-typical groups is characterized by specific socio-economic factors, personality values and communication behaviour. For example laggards are the most disadvantaged group along the socio-economic scale.

When studying the diffusion of ICT, at least one more category must be added: the refusers, who consciously resist usage throughout their lives (also known as diehards).[4] The exis-

[2] Rogers published his book, *Diffusion of Innovations in 1*962, what he developed under the influence of his critiques. We use the 1995 version of his general diffusion theory.

[3] Rogers uses the term innovation in the broadest sense not only for technological objects, but ideas etc. However, we will relate the term to technological innovations.

[4] A good example for refusers are those who plan not to switch to digital television (http://en.wikipedia.org/wiki/Digital_switchover), even after analogue television broadcasting is completely switched off. According to forecasts in the UK, 6% of the population will refuse to watch digital television even if the change would cost them nothing after the 2012 analogue switchoff. They object

tence of this group indicates that no technology ever penetrates a society fully. To reach 100% diffusion both society and technology need to change as compared to their initial status when the innovation was introduced.[5]

The process of diffusion is broken down into different stages from the individual user's point of view. First, one typically acquires information regarding innovation through mass media channels (or cosmopolitan communication channels). The following three phases are dominated by interpersonal channels (or local channels). In the second phase, persuasion and opinion forming take place, followed by deciding on the adaptation, finally evaluation and confirmation of the usage. Of course, refusing the implementation (even several times) is an option too, but it can be followed by acceptance, and vice versa, the evaluation of implementation can lead to discontinuing usage.

Rogers analyses the characteristics of an innovation affecting its own diffusion (such as relative advantage, compatibility, complexity, trialability and observability), but gives little attention to their socially constructed nature.

The main advantage of Rogers' theory is that a key role is ascribed to communicative processes. This momentum makes the theory a close relative to other approaches introduced in this chapter (such as *SCOT* and *ANT*). Rogers' theory can be drawn upon in the analyses of such information society related issues as the digital divide or e-inclusion.

SCIENCE, TECHNOLOGY AND SOCIETY STUDIES (STS)[6]

The beginning of Science, Technology and Society studies dates back to the early 1970s, when the first studies were published (Cutcliffe, 1990). The novelty in the pioneering works, which lends them their special character even today, was that they stressed – contrary to technological determinism – society's crucial role in the development of science and technology, framing the three intermingling domains in complex theoretical systems. The works of philosophers, historians and sociologists were collected in two books in the mid-eighties (Mackenzie et al, 1985; Bijker et al, 1987), which have become the most cited publications of this school. Some of these approaches have developed into theories, generating further discourses and *STS* has been crystallised into an interdisciplinary field of research with both common research areas and methodology.

The *STS* school is far from being the dominant scientific paradigm of this area of knowledge, but has several advantages that make it indispensable when examining information society and ICT. These are its strong empirical basis and complex approach to analysing interaction between technology and society, their manifold co-dependence, and complex co-development. Within the several concepts of *STS*, many schools exist criticising

---

the digital switchover in general, thus their resistance is based on moral considerations. (The Generics Group, 2004: 3).

[5] This issue is discussed in detail in section four.

[6] Though the term "Science and Technology Studies" is more widespread, we would like to hold on to the longer version, since it contains the term "society" which underlines its importance in these approaches.

and complementing each other.[7] The "social construction of technology" school, the "Actor-Network-Theory" and the systems approach to the history of technology all see the relation of technology and society as a "seamless web" (Bijker et al, 1987: 10).

1. Social Construction of Technology – SCOT

The foundations of *STS* were laid down in the 1980s by the "Social Construction of Technology"[8] school, which focuses on the development phase of technologies at the micro level, and pinpoints that technology (and natural scientific developments) are basically shaped by social processes.

The conceptual framework of *SCOT* is built upon four basic notions by Bijker and Pinch (1987). The first is **"interpretative flexibility"** which states that scientific outcomes, engineering (based upon the former) and the resulting technologies are shaped by meanings assigned to the technology by relevant social interest groups. Different meanings and interpretations can conflict in the form of discussions and debates between these groups; and that is the true determinant of technology's functionality and design. **Relevant social groups** can consist of individuals, organisations and institutions. All groups are included for whom technology related problems are relevant: not only user groups, but non-users too, who also form their own opinions about a given technology and its implementation.[9] The social component can be summarised by stating that the functionality of a technology is mainly determined by what users want to use it for and how they want to use it. Scientific achievements and engineering provide a framework which limits the unfolding of user needs.

Any given technology stabilizes when debates are settled. This is the phase of 'closure and stabilization'. Closure, however, does not mean finalizing: newly joined user groups can reopen the debates which can lead to new modifications to or variations of the existing technology (Kline-Pinch, 1999: 113–115).

Using the terminology of evolutionary approaches, we can say variations, mutations and hybrids are brought to life during the diffusion of a certain technology, which is chiefly true for ICT. Take the different variations of computers (desktop PC, portable notebook, PDA, etc.) or the convergence of mobile phones with other electronic devices (such as PDAs, digital cameras, mp3-players, game consoles, or GPS devices) which are typical hybrids. Bijker and Pinch emphasize that the meanings assigned to technologies are determined by the

[7] On the following pages we summarize some studies from the book, The Social Construction of Technological Systems (Bijker et al, 1987). The studies are focussing on the common issues of sociological and historiographical approaches to technology and society, and have become basic works of the field.

[8] We note that the concept of socially constructed technology is not only peculiar to SCOT. Other schools, like the Social Shaping of Technology also follow this conceptual path. Thus SCOT has become a differentiating trade mark of this school.

[9] A good example is the pejorative nickname of the mobile phone in Hungary in the 1990s, when it was not widespread: "rudephone" (bunkofon in Hungarian). This term was mostly used by non-users, who found it annoying to see other people making phone calls in public places.

norms and values of social groups which draw the "wider context" of socio-cultural and political environment into the set of determining factors. Drawing on the wider context concept, R. Laudan argues that changing social values can bring new technological constructs or their complete generation to life. The heterogeneous and hierarchical community of technological development functions as a mediator of social values and forces value orientation in society to change (Hronszky, [1997] 2002: 101).

Introducing the wider context into the concept, *SCOT* drew attention to the importance of macrostructures, though not to elaborate on them in detail (Klein–Kleinman, 2002). The shortcoming of *SCOT* is that on the one hand it pays little attention to reverse processes, namely the social implications of technology, and on the other hand it does not discuss the whole life cycle because it misses out the growth, maturity and decline phases.

The commonalities between diffusion theory and SCOT are apparent: both theories consider communication processes between and within social groups as dominant factors. The two theories can be considered as two sides of the same coin, though their theoretical synthesis is yet to be completed. Instead, their joint application can be found in a variety of empirical researches. Jakku and Thoburn (2006) used them as a framework for analysing agricultural decision support systems, Fontana and Sørensen (2005) applied the two theories to develop an approach where mobile services development was studied as interactive innovation; or they were used for studying how innovation diffuses in the British construction industry (Larsen, 2005). The efforts that combine the advantages of the two approaches are incidental, isolated and use different components of the theories depending on to what field the researchers apply them. A systematic synthesis of the two approaches would definitely contribute to a deeper understanding of innovations in the information age.

2. Actor-Network-Theory

Actor-Network-Theory is another school of STS studies, which is more and more widely used. It is a new branch of the sociology of science and technology, the basis of which was elaborated by Michel Callon, Bruno Latour and John Law in the 1980s. They – along with other scholars – developed their concepts into a theory.

A basic statement of *ANT* is that technological objects along with their socio-political context co-develop and shape each other mutually into socio-technical entities through constant interactions. The objects and their context form heterogeneous networks made up of human and non-human components which are connected to each other dynamically. These heterogeneous components can be objects, techniques, institutions, organisational solutions, human abilities or cognitive structures.

Human components as network builders are constantly formed and constituted by the networks they are part of. Actors in this network are connected by intermediaries, which in many cases, have social meanings. Texts, technical artefacts, currencies or human skills can function as intermediaries.

One of *ANT*'s – much debated – theorems is that the natural state of society is disorder. Order is achieved through the constant and endless efforts made by the actors to build networks.

Callon (1987) argues that an actor-network cannot be derived either from the actor or the network. The actions and the will of actors are inseparable from the network, and their effect runs through the whole network.[10]

The above mentioned vanishing boundaries lead to several consequences. Methodologically, on the one hand *ANT* focuses on events and outcomes, instead of actors, and on the other hand, a common terminology is applied to analyse both human and non-human components (Király, 2005: 54). Furthermore, technology's impact on society can easily be explained by the way in which solid technological objects as manifestations of social relations can ensure social cohesion (Latour, 1992).

When building networks, actors allocate resources and seek allies to enforce their interests. Thus, the nature of network building is principally political, and its central notion is power. By understanding power relationships, the way actors are defined, associated and obliged to be loyal to alliances can be described. The real source of power is where the factors holding actors together are defined and redefined constantly, and where the obligatory point of passage can be found.

The constant shifting of power between technology and society is called **translation** (Latour, 1992): as a result of this process, networks are formed progressively, in which certain entities gain control over other entities.

ANT redefines the role which actor-networks play in the reproduction of power. It denies that technology – and that in particular technological objects – are only instruments for and manifestations of reproducing power inequalities. It states that power is the consequence of collective action, not its cause. And since human actors are also part of the networks as are technical objects, the less powerful also have the opportunity to affect actor-networks, and through them, technology. *ANT* theorists, though, do not deny the existence of power inequalities or their reproduction through technology to some extent. At the same time they emphasize that the networks – stabilised and held together by different translational strategies and tactics – embedded in technological objects, show a certain degree of flexibility which can be modified by all actors of the network. They ask questions about how power translation operates at the level of organisations (Law, 1992). At the level of society the same question goes like this: how does the burden of past social values carried by technological tradition affect societal changes (Király, 2005: 49–51).

It is no accident that Feenberg (2003) uses e-mail as an example for how actors with less power can decisively determine the course of technology. The development of ICT is full of stories such as this where non-professional, but adept users started using technology in ways which had not been anticipated by the engineers and designers of the original technology.

[10] The vanishing boundaries between actors are partly explained by Law's (1987: 111–134) "heterogeneous engineering" concept. Engineer-sociologists, while designing a technological object, define a certain history and society in which these objects are implemented. Thus, they do not separate the conventional categories of technology and society.

Actor-Network-Analyses in practice

ANT seems to be an ideal approach for studying information communication technology, and it is used as a framework for analysing ICT systems and projects.

A case study by Stanforth (2006) on the implementation of an e-government information system in Sri Lanka shows the theoretical power of *ANT*. A financial reform including the implementation of a public expenditure management (PEM) information system was carried out in the country from 1995 to 2006. The implementation project was only a partial success. The PEM was built for the Ministry of Finance, the Prime Minister's Office and some civil organisations and was financed by the Sri Lankan government and international organisations. The writer analyses to what extent the global and the local stakeholders of the project were involved in different stages of the project, and how the amount of control they possessed changed in time (translation). The actors are grouped into interested, hostile and neutral stakeholders. These roles changed constantly during the project. The failure of the project was caused by the lack of an obligatory point of passage locally (e.g. within a governmental organisation), which could have coordinated the global and the local networks. The bottom line of the case study is that the failure of implementation was not due to the characteristics of the technology, but rather to the inadequate operationalisation of the complex actor-network.

3. Systems approach to history of technology

Science and technology historian, Thomas Parke Hughes (1987) studies technological systems at a metalevel, and – similar to the previous schools – thinks technology is both socially constructed and society shaping.

Hughes argues that technological systems are heterogeneous networks consisting of physical and non-physical artefacts such as organisations, scientific components, legislative artefacts or natural resources. The components are socially constructed since they are made by individuals (or using Law's terminology: heterogeneous engineers). The characteristics of the specific components are derived from the system they interact with. Changing any system component results in changing all other components. The heterogeneous components of a socio-technological system are coordinated by hierarchically organised system builders.

Technological systems are open. They function embedded in an environment they cannot control. Certain elements of the environment can depend on the system, yet they will not become part of it due to lack of interaction. The uncontrolled environmental elements lead to uncertainty in the system which drives it to incorporate them. In other words, uncontrolled environmental elements make technological systems grow.

Pattern of evolution

The evolution of Large Technological Systems (LTS) – such as electric power – follows certain patterns. Social construction takes place when inventions are transferred to innovations, and at the same time, they become components of a technological system. Inventions

in a LTS can be conservative or radical. Radical inventions typically inaugurate new systems, while conservative inventions help to improve the existing system incrementally. The pace of development is usually faster upon the introduction of new technological systems, while the incremental improvement of technological systems by conservative inventions is much slower.

Conservative inventions are usually products of professional inventors who work in mission-oriented private or public research organisations. Radical inventions resulting in new technological systems are less likely to appear in these organisations. The source of radical inventions is typically the independent inventor, who played a crucial role in the renewal of industries in all ages.

Innovations become products through technology transfer. During this process technological systems respond and adapt to environmental changes developing a so called technological style. This term is useful in describing and explaining the differences between various forms of certain technologies occurring in time, space and different organisational and cultural contexts.

The next evolutionary phase of large technological systems is growth and consolidation. A typical problem during the growth period is the reverse salient. Reverse salient appears in a system when a component of the system becomes dysfunctional due to an incremental innovation of another component. This can be corrected with another – usually conservative – invention.[11] In many cases the reverse salient cannot be corrected in the old technological system. This inaugurates a new system, which completes or competes with the old one.

Nevertheless, without a reverse salient, there can also be a change in the course of research and development. A **presumptive anomaly** can have the same effect. In this case system builders anticipate such future changes – based on scientific calculations – that a technological system becomes inoperable or uncompetitive compared to a new and more effective system.[12]

Consolidated technological systems respond to the changing environment (e.g. social changes). This drives competition between systems, which can have several outcomes. One is the decline of the old system and the domination of the new one. Another is that further innovations can ensure the integration of the two systems into a universal one, as happened in the case of direct and alternating current electric power systems. Today something similar happens in the case of converging landline, wireless and mobile telecommunication networks (see NGN development program[13] or the BcN program in south-Korea[14]).

Another important characteristic of large technological systems is their stratigraphic nature. New technological systems are initially built where the network of preceding systems

[11] The compass became a reverse salient on iron ships using electronic equipments, which made it unusable. To correct this, a new device had to be invented which could function in the altered conditions too. This was the gyroscopic compass.

[12] Constant (1980) showed that in aviation, the turbojet engine was invented because aerodynamics had predicted piston-engines and propellers would need to be replaced when flying near the speed of sound at great heights, and not because they had already proved to be dysfunctional in those conditions.

[13] Next Generation Network, a global standardisation initiative by International Telecommunications Union (ITU NGN-GSI, 2003).

[14] Broadband converging Network (2006 Korea Internet White Paper, 2006).

are denser (Hughes, 2000). For instance, telecommunication infrastructure is built principally where preceding systems such as road and electric infrastructures are present. Internet started unfolding on copper landline telephone infrastructures, then, expanded to coaxial, fibre optic, wireless, and finally mobile telecommunication networks. Today, electric power infrastructure has become the "natural" frontier of the Internet. Nevertheless, the Internet is a good example of how new systems affect older ones: in some developing countries, electric power supply is being extended to new territories in order to provide telecommunication services (e.g.: implementation of wind powered mobile base stations).

LTSs gain **technological momentum** while growing. This means components of a system (especially capital intensive ones with a long amortisation period) move in the same direction following certain goals along a specific trajectory.[15] Technological momentum can account for preserving outdated social values and relations. When a technological system is emerging, social norms and values manifest in it, but after consolidation they are carried along unchanged in a changing social environment. Technological momentum can move a system forward that has already lost its functionality. That is why technological stasis (the end of evolution) can be delayed in contrast to social changes. Technological stasis is followed by the decline of the system which is replaced by a new one more able to adapt to the changing environment.

In the opposite case, when technological development is ahead of social development, **social resistance** – as the evolutionary school of history of technology calls it – can occur. This leads to either the delayed diffusion or the total disappearance of the innovation, or the modifications of dominant values and lifestyle in a given society (Hronszky, 2002: 73).

The phenomena of technological momentum and social resistance can immediately explain the delayed diffusion of inventions with obvious advantages. The widespread use of electric cars, for example, could ease environmental damage through decreasing exhaust fuel emission. To fully replace internal-combustion engines and the technological system they are part of, a consolidated alternative technological system has to evolve which is as large and complex as its predecessor. In Hungary, a kind of social resistance which is rooted in cognitive and lifestyle related causes is responsible for the sluggish up-take of internet usage.

INFORMATION AND COMMUNICATION TECHNOLOGY

1. Limits of applying STS studies in empirical research

The application of these theories and schools on ICT is problematic in many respects. First, as we stated above, there is not a single, widely used paradigm which has synthesised the various schools and theories dealing with technology and society. Second, these fragmented

[15] An LTS with a high level of momentum can give the false impression of being out of control. The period between the two world wars was characterized by such systems. Today, the mobile telecommunication industry has gathered a high level of momentum, which invested hundreds of millions of euros into building third generation mobile networks. At the moment, in spite of the lukewarm interest of mobile users in services offered on these networks, the mobile industry keep pushing forward making this LTS grow.

approaches do not have a fully-fledged mode of application to the relationship of Information Control Technology (ICT) and (information) society.

Third, *SCOT, ANT,* the evolutionary- or the systems approach to the history of technology – when dealing with information society – does not take into account the results of approaches (such as information science or information systems literature[16] or social informatics, information management and knowledge management, communication and media studies) studying the very essence of the information age: information, communication and knowledge. The list of unnoticed or partially incorporated sciences, which focuses on the role of ICT in human information processing and other cognitive activities, is much longer. These, though, miss the approach of STS and evolutionary schools, particularly the concept of technology and society as a seamless web. Merging the two modes of understanding information society is in its infancy, though studying ICT systems cannot be complete without them both.

2. ICT as a technological system and its characteristics

Considering the role of information and communication technology in society, – agreeing with the theorem formulated in the information society chapter of this book: *The processes of information production take place in the minds of individuals…* – we put the emphasis on the ICT-enabled extension of individual and collective cognitive skills in time and space, on the increase of information processing performance, and on new patterns and schemes. Technology is of secondary importance from this point for view, but not from its implications for society.

From what has been said so far, ICT can be seen as a universal technological system, which is interwoven with and permeates older technological systems, creating new technological systems at the same time. The network of its human and non-human components may surmount any previous systems in complexity and heterogeneity. ICT's peculiar function is to support the acquiring, storage, processing, transmission, dissemination, management, control, transformation, retrieval and use of information typically in a digital format.[17]

ICT is characterized by a relatively traditional regularity: the accelerating pace of development. Two million years passed between the invention of the most primitive stone tools and the chopper cores. It took only a couple of hundred thousand years for the appearance of flake tools (Hronszky, 2002: 3). As far as communication technologies are concerned writing was invented – at least – tens of thousands of years after the appearance of spoken language. Printing (in Europe) came 5,000 years after writing, and after another 400 years, the telegraph was invented, which was the first global and real-time telecommunication instrument. The first commercial internet service was launched 150 years after Morse's first mes-

[16] Steve Sawyer (2001) criticises the second edition of *The Social Shaping of Technology* for completely missing out references to these two sciences.

[17] Some flagship technologies of ICT are microprocessors, telecommunication infrastructures, or – belonging to the world of non-physical artefacts – e-mail and SMS applications, and of course, the world wide web (www), which can be considered a technological system in itself.

sage. In the information age, successive new technological systems replace each other with a greater and greater acceleration.[18]

Variations, mutations and hybrids appear and disappear in uncountable quantities and in a surge. In the case of bicycles, it was not obvious at first sight that the stabilisation and closure phase can be reopened. It is much more striking for ICT artefacts. Think about mobile telephones.

Another crucial evolutionary pattern – and as general as acceleration – is the increase in performance of instruments. This is driven by the demand for storing, processing, displaying and transferring larger and larger quantities of information, and by the increasing number of human activities related to them. The growing amount of aggregate performance is indicated by the world indices of energy consumption by ICT, and the growing concerns for energy savings.

Convergence features physical (communication devices, networks) and non-physical (databases, communications channels, content distributing systems) artefacts of ICT systems from the beginnings. ICT as a term refers to the still unfinished convergence of information technology (IT) and telecommunication systems. The outcome of this convergence is an integrated and unified technological system at a higher level. At the moment, we can observe the convergence of ICT and other systems such as television broadcasting and consumer electronics at the level of devices and standards. These systems had belonged to ICT for a long time, though in a less integrated way.

ICT also pervades systems (without exception) which existed far earlier than the information age. This happens to all the fundamental technological systems of conventional industries and sectors: agriculture, industrial production, conventional services (financial, logistics), education, healthcare and public administration.

Everyday life is no exception to this. Conventional "real life" activities complemented, supported or mediated by ICT are expanded into the dimension of virtuality. Thus, we can speak of e-commerce, e-administration, electronic communication, internet banking, etc. The terms pervasive or ubiquitous computing and ambient intelligence refer to this phenomenon.

INFORMATION SOCIETY AND ICT

As we noted earlier, the bulk of information society related literature studies technology's impact on society. Thus, we concentrate on factors that signal the socially constructed nature of ICT, or their interplay. These are the issues of control and the changing structure of society.

1. The control revolution

The first question to ask about ICT is why did these technologies emerge in the second half of the 20th century? Why not earlier or later? What social processes brought them to life and made them indispensable?

[18] The first home video system using VHS format was introduced to the market in 1977. DVD video hit the market exactly 20 years later. In 2006, only 6 years have passed and two new and non-compatible formats were launched: Blu-ray and HD-DVD.

James R. Beniger (1989), in his classic book, finds the roots of information technology in industrial societies. Information society is the ultimate solution to the control crisis of the industrial age, revolutionising control mechanisms by – among other means – ICT. Beniger sees society as a processing system sustained by its control systems: bureaucracy and technology.

Beniger illustrates the crisis of control with pathological symptoms of the American industrial economy. Problems arose first in controlling distribution-related information. The telegraph provided one of the first solutions. Logistical problems caused by growing mass production also amplified the crises of control. What should be produced? How much? When? How should the supply chain be organised? These questions had to be answered on a daily basis and the control mechanisms and techniques at hand could not provide adequate solutions. The first step to resolve these problems was the emergence of a managerial class, who specialised in control related workplace activities. Alongside production and distribution, consumption started to show symptoms of a control crisis. A more intensive flow of information between vendors and consumers was necessary to utilize the capacities of production lines more effectively. This facilitated the introduction of marketing activities, and later on, in the United States, between the wars, lead to the development of new market research methods.

However, the revolutionary solution to this 20th century crisis came with the emerging information society from the 1960s on: this is the real control revolution. The improvement of production efficiency took place in industrial society, but the problems caused by it are only resolved by revolutionising the control systems of distribution and consumption, and this is what has been happening in information society.

Focusing on the development of computers and the Internet, we can observe the signs of control crisis. These two technologies were originally used by large private and public organisations in desperate need of managing, processing and distributing increased quantities of information, where earlier technologies had become obstacles to the further growth of the organisation.

2. Network: the new mode of organising society

Manuel Castells, one of the most cited scholars in the information society literature, explains the origins of ICT from the perspective of social developments. He argues that the network is the dominant structure of society in the information age: power, money, information and society itself is reproduced in networks. ICT enabled the management of these network structures. Networks can incorporate practically anything (Castells, 1997). Online communities are plausible examples of networking. Computers and telecommunication networks were originally designed to process and exchange data and databases, but they were used for interpersonal communication from the very beginning. The alternative use of new devices assists ongoing social changes. Electronic mail, which is the equivalent of postal mailing, enabled more flexible and real-time one-to-one communication. The real networking, though, starts with mailing lists, which are the first form of many-to-many telecommunication. One of the mailing lists was run by academic researchers discussing science-fiction. Online networks of users are organised around common interests. Online communities have become widespread and the repertoire of their communication channels includes online discussion groups, public chat rooms, networking web sites, peer-to-peer networks, weblogs, photo and video sharing websites and their various combinations.

Social networks supported by electronic communication channels play a crucial role in the development of ICT as a technological system. The circle of potential independent innovators widens – for example, user innovation. It is easier and faster to channel feedback regarding innovations from relevant social groups at the development stage, thus diffusion and development of a certain innovation can advance parallel with each other. The increasing intensity of information flow between vendors and customers results in customised and personalised products and services, in particular information industries, multiplying the variations of technological artefacts.

SUMMARY

Having taken a closer look at the relationship between technology and society, we see that a complex and interactive network takes shape, in which neither of the factors dominates in shaping one or the other. Society affects technology as much as technology affects society; nevertheless, the complex patterns of their interaction are not yet understood completely.

The dominant relationships and values of a given society are imprinted in technological objects and in whole systems which may carry those values and relationships through later ages. Technology and society co-evolve in time, but asynchronicity can occur too. Because of the effect of technological momentum, it is possible that a technological system reacts more slowly to changes in the socio-cultural context, and vice versa. Technological development can outpace the development of prevailing norms, values and the whole way of life. In the latter case, technology can either lose its impetus, or change society by quelling social resistance.

ICT and information society are the results of radical changes. The revolution in information and communication technologies is a kind of technological paradigm shift. Information society is the age of a new social structure and a new mode of development.

ICT means completely new technological systems (internet, mobile telecommunication, etc.) which technicised new areas of everyday life. ICT assimilates earlier information and communication systems (landline telephone, radio, television, consumer electronics) and increasingly pervades conventional technological systems (construction, logistics).

The emergence of ICT is explained by the crisis of control systems in the industrial age. ICT became the new technological control system and in the meantime, society (as the processing system) has transformed drastically into an information society.

Networks became the dominant form of social reproduction and the mode of development. ICT-enabled social networks react to the development of technological systems, process of which is most apparent in ICT as a technological system.

REVISION QUESTIONS

1. Compare diffusion theory to SCOT.
2. What commonalities and differences are there between the systems approach and the Actor-Network-Theory?
3. Give examples of the socially constructed nature of ICT.
4. How can ICT reproduce power inequalities? Alternatively, how can it change them?

BIBLIOGRAPHY

1. Key bibliography

Callon, Michel (1987): Society in the making. The Study of technology as a tool for sociological analysis (in: Wiebe E. Bijker – Thomas P. Hughes – Trevor J. Pinch (eds.) (1987): *The Social Construction of Technical Systems: New Directions in the Sociology and History of Technology,* MIT Press, Cambridge, MA)

Hughes, Th. P. (1987): The Evolution of Large Technological Systems (in: Wiebe E. Bijker – Thomas P. Hughes – Trevor J. Pinch (eds.) (1987): *The Social Construction of Technical Systems: New Directions in the Sociology and History of Technology,* MIT Press, Cambridge, MA)

Kline, Ronald – Pinch, Trevor (1999): The social construction of technology (in: MacKenzie, Donald – Wajcman, Judy (eds.) (1999): *The Social Shaping of Technology, Second edition,* Open University Press, New York)

2. Optional bibliography

Cutcliffe, Stephen H. (1990): The STS Curriculum: What Have We Learned in Twenty Years? (in: *Science, Technology, & Human Values,* Volume 15, Number/Issue 3, p. 360–372, http://links.jstor.org/sici?sici=0162-439%28199022%2915%3A3%3C360%3ATSCWHW%3E2.0.CO%3B2-J, accessed 25 March 2007)

Law, John (1992): *Notes on the Theory of the Actor Network: Ordering, Strategy and Heterogeneity* http://www.lancs.ac.uk/fss/sociology/papers/law-notes-on-ant.pdf, accessed 10 April 2007)

Kline, Ronald – Pinch, Trevor (1999): The social construction of technology (in: MacKenzie, Donald – Wajcman, Judy, (eds.) (1999): The Social *Shaping of Technology,* Second edition, Open University Press, New York)

Stanforth, Carolyne (2006): Using Actor-Network Theory to Analyze E-Government Implementation in Developing Countries (in: *The Massachusetts Institute of Technology, Information Technologies and International Development,* Volume 3, Number 3, Spring, p. 35–60, http://www.mitpressjournals.org/doi/pdf/10.1162/itid.2007.3.3.35, accessed 7 April 2007)

SZILÁRD MOLNÁR – BENCE KOLLÁNYI – LEVENTE SZÉKELY

Social networks and the network society

THE PROPOSITION

Networks have become the most basic elements of human civilization since everyday life would be unimaginable today without modern road, public utilities and communication networks. Although the scientific investigation of social networks has been going on for some decades it has only recently become such a popular area of research. High-powered computers have made it possible to analyse various natural systems (e.g. cells) and social phenomena (e.g. the use of the Internet) which can be interpreted as networks, on the basis of measurable indicators. Hundreds of millions of people use the network of the Internet on a daily basis, which is why it has been found to have a fundamental effect on the social system of relationships, on formal and informal structures, **social capital** and the development of trust.

Sociologists have investigated for one hundred and fifty years the process whereby personal relationships and the attachment of individuals to primary communities (family, neighbours and friends) are gradually becoming less important. This has played a defining role in sociological ideas and argument. This process, which has been underway since the transformation of agrarian societies, can be characterized to this day by the transition in second order relationships from *Gemeinschaft* (community) to *Gesellschaft* (society) (Tönnies, 1957 [1887]). Agrarian society first changed into industrial society, and now industrial society is changing into information society: the significance of the recent change is comparable in importance to the transition which preceded it. Already by 1976, Daniel Bell argued that the strategic resources moving the development of post-industrial societies will be information and theoretical knowledge (Bell, 1976). Bell suggested that two factors had important, society-transforming roles, the development of new infrastructure, namely telephone, computer, fax and cable TV networks that promote communication and data transmission built upon existing transportation and energy-supply networks linking society. These culminate in a fusion of computerized data processing and communication technologies. All these developments have led to the network becoming one of the major areas for research into the information society.

Many researchers see the advance of organisations based on impersonal relations – that is, mediated by institutions, contracts, communication technologies – as one of the basic dangers in the development of modern societies. At the same time, the role of local communities which directly transmit or preserve social values and norms is diminishing. It seems that many modernising processes (for example industrialisation, globalisation, and the revolu-

tion of information technology) are actually aiding the decline of civil activity and strengthening individualisation. It is in this context that the concept of social capital plays an increasingly important role in social science: here, one of the most important points of reference is the work of Robert D. Putnam, professor of Harvard University (1993, 2000, 2002), though the concept itself has a history which can be traced back to the works of Mark Granovetter (1973), James S. Coleman (1988, 1990) and Pierre Bourdieu (1986). There are several definitions of social capital, but what all of them have in common is that they connect the concept to social networks in which interactions, attractions and friendly relations related to the everyday life of people develop. By social capital, we mean non-material resources that have resulted from relations between the individuals that make up the networks, and influence the social and economic processes of social cooperation taking place on social and community levels (e.g. family, neighbourhood, local and national).

Another reason for the intensifying interest of the social sciences in the conceptual sphere of social capital is the real or imaginary danger perceived, that with the spread of information- and communication technological tools (hereinafter: ICT) being used in society, the interpersonal communication relationships become more and more superficial, and the direct human relationships that function in primary communities – for example within the family, or in a circle of relatives or friends – simply become atrophied. The vision of millions of lonely users united by the Internet, or the fear that this vision will come true, can be found historically in the discussions of social scientists, which is not surprising, since with each passing year we spend more and more time using the Internet. This observation raises the question: if by facilitating communication ICT tools promote the development of new networks, and effective economies tend to work like networks, how does all this affect social integration, the cohesion of small communities, and the social partnerships of the individual?

THEORETICAL BACKGROUND: THE CONCEPTUAL FRAMEWORK OF THE NETWORK SOCIETY

The expression "**network society**" first appeared in sociology in the late 20th century. The concept became better known through the work of Manuel Castells (Castells, 1996; Castells–Cardoso, 2006). According to Castells (born in Spain) who has researched in France and the United States, network society has a new social structure and process which is ensured by information and communication technologies based on microelectronics. In a network society, it is with the help of computer networks that information is created, processed and transmitted, building on the knowledge accumulated in the **network hubs**.

According to Castells (Castells, 1996), in the age of industrial society, networks played an important role mainly in the private sphere, while in production and in the civil and public sphere, hierarchical institutions; large companies, the state, the church and the army, structured as levels of power vertically built on one another – played the dominant role. In network societies, the basic institutions transform and become more flexible and changeable.

In Castells' view, the economy also went through a major change at the end of the 20th century: the foundations of the new type of social arrangement are no longer natural resources, but the digital communication channels. Castells argues using statistical data that

the **network economy** is growing at a faster rate than the earlier economic forms typical of the industrial society. In his example he examines the rate of development of the United States, where according to official statistics the rate of growth between 1996 and 2006 was twice the rate measured between 1975 and 1995 (Castells, 2006: 8). Similar observations can be made when European states that converted at an early stage to the network economy are examined, such as Finland or Ireland. When evaluating the effects of the changes they have undergone, several factors must be considered in order to be successful. Finland needed an effective innovation policy and an economic restructuring brought about mainly by external economic factors. In the case of Ireland, they made use very effectively of aid from the European Union.

Castells stresses several times in his work that it is not technology that changes society, but rather that changing social needs interact to generate the development of technology. In the economic sphere, operational methods that have become more effective through technological development can be observed. For example the internal communication and work organisation of multinational companies and the technological innovation accompanying development through production processes supported by robots. In Castells' model, there were three equally important consequences of all these changes:

1. Science and innovation played a decisive role in the changes since the spread of microelectronics made the development of new information and communication technologies possible.
2. The labour market changed as well with the development of the network economy. The new network company forms require a highly qualified, flexible, independent workforce.
3. The internal organisational structure of the companies changed radically according to the logic of the network.

The formation of network society first started in the 1960s. Network logic has an effect on all subsystems of society, yet at first, only technological and economic changes could be detected. According to Castells, the social, political and cultural effects could only be felt some 15-20 years later.

Communication has always had a decisive role in the use of computer networks. Research shows that among activities carried out with the mediation of the Internet, electronic mail is by far the most prevalent: research carried out within the framework of *World Internet Project* supports this as well (WIP 2002–2006). One may presume, then, that network technology also has a decisive effect on the structure of interpersonal relations and sociability. All over the world, a large volume of sociological research has been reported concerning the social relationships of internet users, and these studies have unanimously shown that the use of the World Wide Web does not reduce relationships based on personal contact, it complements them.

According to Castells, the members of network society are not alienated people, but rather individuals who cultivate highly developed systems of relationships. The value of the individual is positively reappraised in the network society – this is one of the most distinctive cultural characteristics of the new society.

In the network society, the "communication space" surrounding the individuals is significantly transformed, and one of the important components of this process is the change of form of the media. Castells emphasizes three major transformations of the media:

1. Mass communication is mainly concentrated in the hands of international media enterprises that are both, global and locally embedded. This is true of music publishing, and television, as well as the radio and printed media.
2. In the network society, communications channels are digitalized and interactive. Accordingly, the developed societies of the world are increasingly turning away from the mass media and orientating themselves towards personalized, tailor-made media contents.
3. Thanks to the new communications technologies, a new media type has developed and become stronger, dubbed a "horizontal communications network". Good examples of the increasing number of new communications forms appearing on the Internet are three new "inventions": the *blog* (internet diary), the *vlog* (video diary), and the *podcast* (own radio broadcast). These individually provided contents are easily accessible to anyone, at the same time their producers are able to remain independent of media companies and national governments. Castells calls this complex process the spread of mass communication operating according to its own internal rules (Castells, 2006: 12–14).

Network society also has an effect on political life. Castells names mediatization and globalisation as the two most important factors (Castells, 2006). When he analyses the connections between the media and politics he is reluctant to introduce television and especially the Internet as a kind of "persuasion machine". Referring to the concepts developed by the school of reception theory, he directs our attention to the significance of the individual interpretation of the receptor. According to this, media contents do not have general interpretations; each interpretation is unique and strongly connected to the common interpretative framework of the individual.

Apart from the constant and universal presence of the media, globalisation has also caused significant changes in the political system. Castells is of the opinion that the development of network society is rocking the foundations of the institution of the nation state: since the network society operates globally, the state cannot work solely within a national framework any more. At the same time, there are serious cultural obstacles in the way of setting up a worldwide government that adjusts to the process of globalisation. With the construction of the network state, national governments may renounce part of their countries' sovereignty. In Castells' view, the European Union is the best example of this, where all the nation states are organized into a form of social, economic and political network (Castells, 2006).

KEY CONCEPTS, KEY PROCESSES, KEY PROBLEMS

1. Social networks

Jacob Levy Moreno is considered to be the pioneer of network studies. The Romanian-born psychiatrist who worked in Austria and the United States developed the method of *sociometry,* which enables the mapping of network connections, in the mid-1910's. Moreno sent a letter to the Hungarian government in 1916, in which he recommended the use of sociometry for the reorganisation of a relocated community, and then a few years later, in a

newspaper article, he described some other areas where sociometry could be applied. With his method, the internal structures of groups can be discovered, but it can also be applied in action research or in the examination of roles (Moreno, 1923).

According to the relevant entry in Wikipedia, the expression sociometry is of Latin origin, and the meaning of the word *socius* is "companion", while *metrum* means measure. Moreno characterizes sociometry as a method of investigation with the help of which we can understand the coming into being and organisation of groups, as well as the role of individuals within the group. Sociometry reveals those hidden structures, based on personal likes and dislikes and the unique relationships between individuals, which determine the basis of the group's organisation and operation.

Moreno examined the relationships between individuals with the help of simple questions, supposing that the hidden choices based on personal likes correspond to the structure of the network. The relationships between the individuals under examination can be illustrated with the help of a simple diagram, a so-called sociogram. In this diagram, the members of the group are represented by points, while the relationship between them, whether it is mutual or not, is signalled with an arrow going in either one or both directions. The method of sociometry is often used to examine communities in school classes, or other similar closed communities.

2. Linked

The network approach can be used for analysing relationships within smaller groups and also for analysing complex global systems. Several disciplines deal with the investigation of networks: besides mathematicians, social scientists also take part in network research. In his book, published in English in 2002, entitled Linked: *The New Science of Networks,* a Hungarian-born mathematician, Albert-László Barabási, gives a searching analysis of complex networks (Barabási, 2002). In the introduction of his book, Barabási draws a parallel between a typical case that sheds light upon the operation of the worldwide network of computers and the converting activities of Saint Paul. In the 1st century A.D., Saint Paul laid down the foundation for the worldwide spreading of a religious belief with the help of network logic: he went from settlement to settlement, and built a community network by creating relations between Christian communities. In February of the year 2000, a fifteen-year-old Canadian teenager operating under the name of Maffia Boy did the exact opposite by sending viruses and infecting several thousand computers, thereby paralysing the data traffic of leading American commercial and service providers' homepages. The logic of network operation made it possible, via the infected computers, to simultaneously send to *Yahoo, Amazon, eBay* and other well-known American homepages, an impracticable amount of queries, temporarily making them inoperative. Although these two examples seem distant both in time and nature, what is common in both of them is that they demonstrate the timeless power of networks.

Barabási's work differs from writings that are characteristic of the second half of the 20th century. One of his reviewers' points out that in his mathematical modelling of networks, Barabási applies perspectives from a social science approach, while at an earlier stage it was primarily natural science models that were influential on social scientific recognition and theory construction (Letenyei, 2003).

Originally, Barabási investigated the network operation of the Internet, and realized that the World Wide Web consists of a small number of central homepages, in other words, centres, and of a vast number of peripheral pages. This characteristic of the network, led Barabási and his colleagues to start talking about a **scale-free network** (Barabási, 2002). They meant that there is no typical point on the Internet (regarding the number of relationships) that one could call "ordinary". In other words, all the other points are quite similar to it. Thus, the internal scale, which played an important role in the earlier phase of network research, does not apply to these scale-free networks. The majority of complex networks found in nature are built up of enormous centres and many little peripheral points.

Besides clearly defining the area that he is studying, Barabási illustrates his theory through numerous economic, social and scientific examples. According to his most important observation, both in nature which surrounds us and in human society as well, most networks do not develop accidentally. They develop progressively by taking into consideration the already developed network centres.

Barabási illustrates the difference between the two kinds of development with an example from transport. In the United States, all larger cities can be reached via the interstate highway system. At the same time, however, there are never several dozen highways leading to a settlement (the really large centres are missing). If, on the other hand, the development of US air transport service is examined, there are a few exceptionally important centres (*hubs* in network terminology). The airports of Chicago, Atlanta, New York and Los Angeles are such hubs, while the majority of airports are service stations with minor traffic. So there are centres and peripheral points consequently, we are dealing with a scale-free network.

3. "Six degrees of separation"

Despite the complexity of human societies, the average distance between two members of a community is perhaps less than one would at first think. In 1967, Stanley Milgram, American social psychologist and his colleagues began an exciting experiment (Milgram, 1967). They asked some 300 randomly chosen American citizens to send a parcel to a person they did not know with the help of their friends and acquaintances. The rules of this playful experiment are simple: the parcel must reach its destination as soon as possible, and in order to achieve this it is worth choosing a person from among one's circle of friends and acquaintances who has a better chance of knowing the addressee or a close friend of his/hers. Most of the letters were sent off from Boston (state of Massachusetts) on the East coast, and Omaha (the largest town in the state of Nebraska) and Wichita (state of Kansas) in the central part of the United States, and the addressee also lived in one of the cities mentioned above.

In the course of the experiment, of the 296 letters that were sent, 232 were not received by the addressee; the participants simply did not pass on or forward the postal items. Milgram and his colleagues examined the route of those 64 letters that arrived at their destination and came to the conclusion that two randomly chosen Americans are, on average, 5.5 steps "away" from each other. In his study, Stanley Milgram describes the United States as a *small world.* At the time of the publication of the study the population of the United States had just exceeded 200 million.

It is interesting to note that prior to Milgram's experiment, a Hungarian writer, Frigyes Karinthy, had already described this phenomenon in a short story of his published in 1929, almost exactly predicting the conditions of the experiment:

> "In order to prove that the members of the Earth's population are closer, in all respects, to one another than they have ever been, a member of the society proposed an experiment. Let us designate any individual from among the one and a half billion dwellers of the Earth, on any point of the Earth, and he is willing to bet that through no more than five other individuals, of whom one is a personal acquaintance of his, he will be able to make contact with the said individual, through direct acquaintances, as they usually say: You know X.Y., could you please tell him to tell Z.V., who is an acquaintance of his...etc." (Karinthy, 1929).

In the short story, the messages reach their destinations each time, with the mediation of a maximum five links in the chain. It is either King Gustav of Sweden who passes on the protagonist's message at the request of his tennis partner, or the workshop supervisor of Ford, the American car factory, helps a Hungarian newspaper publisher to forward the message. In his short story, Karinthy calls attention to the fact that in the course of history, the distance between people has decreased. However, Karinthy's example is more about the fact that certain obstacles have disappeared which, during the age of the Roman Empire, might have made it difficult even for the mighty Julius Caesar to pass on a message to an American native as part of a strange experiment.

Small as the world might have become by then (1967), it is almost certain that Milgram could not have come across Karinthy's short story, because at the time of Milgram's experiment, the Hungarian author's work had not been translated into English. It is Barabási who calls attention to this interesting parallel in his book. He also published extracts from Karinthy's short story in English.

Network research is also strongly intertwined with the discourse of information society. It is not accidental that Barabási was attracted to understanding the network topology of the Internet. Network theory helps us to understand the ongoing process during which in the past few decades, the interrelatedness of individuals, organisations and economic enterprises, in other words so-called **interconnectivity**, has grown significantly.

4. Social capital, civil society

Many sociologists have warned that because of the erosion of those factors maintaining social capital (for example the weakening of **civil society**, the decreasing number of communal spaces that can strengthen social ties, etc.), trust between people and the intensity of human relations have been declining for decades. In a similar way, as the extent to which people are willing to take part in civil activities has declined. In this context, so-called "social capital" is playing an ever-growing part in social sciences, which is further strengthened by the increasing social diffusion of ICT tools.

Social capital primarily expresses the value of human relationships in networks. According to one of the earliest definitions (Hanifan, 1916), social capital is present when, in the course of everyday life, in social connections between individuals and families, good intentions, mutual interests and likes and friendships appear. Hanifan was of the view that when we form a relationship with our neighbours, and they get acquainted with others, we are en-

gaged in the creation of social capital. On the one hand social needs can be met through this route, and with the help of the existing network of connections, the life of the individual and the community can be improved.

This early definition of social capital implies that interpersonal relationships also consist of *resources*. This is what Bourdieu (1986) stresses, suggesting that social capital – the capital inherent in social connections – is primarily, for the individual, a private fortune that they make great efforts to acquire by developing, extending and cultivating their social network.

Coleman (1988, 1990), who looked on social capital as a significant element of economic sociology, uses the concept to refer to human relationships in general, including mutuality, support given to one another and trust for one another.

Putnam called attention to the recession, or decline of social capital and that of "civil" social life, as a consequence of this (1993, 2000, 2002). One of the most important elements of Putnam's work is that he establishes, and supports with much empirical data, the assertion that the once lively civil social life of America has seen a continuous and general decline since the end of the Second World War. One of the strangest and most surprising examples mentioned by Putnam is the observation that fewer and fewer people are willing to take part in bowling as part of a team. Bowling used to be an extremely popular game in America, the title of his best-selling book, B*owling Alone,* refers to this new phenomenon. Nowadays, more people go bowling in the United States than ever before, but the number of organised bowling clubs and associations has decreased dramatically in the past decade. The number of players increased by 10% between 1980 and 1993, while the game played within the framework of clubs decreased by 40%. This simple example of the decline of bowling clubs clearly shows the development of a much broader social process: "The lonely players give up the conversations they might have had during a pizza and a beer, which means no social interaction takes place. Whether the American citizen votes for or against bowling, it is a fact that the case of the bowling clubs illustrates the destruction of social capital" (Putnam, 2000). The beginnings of this decline could already be seen in the 1950s. There is an obvious tendency, as far as the majority is concerned, to search for and establish relationships of an informal nature that serve a cause for a transitory period, but this majority group cannot maintain a civil society (the willingness to associate) and community life based on the norms of reciprocity, mutuality and trust. The success of American democracy and their economy was based partly on this type of civil commitment, i.e. it still is to some extent based on those relations and values of which de Tocqueville (2000 [1835, 1840]) gave such a precise picture in his book Democracy in America. In Putnam's view, maintaining success and competitiveness can only be realized by resurrecting their community commitment, and regenerating American social capital.

It is not surprising that when conceptualising social capital, the concepts of "community" or "civil society" arise, for this terminology describes institutions in which people live their lives in the third sector. Here they come into contact with each other through different organisations, clubs, associations and relationships with neighbours, friends and acquaintances, and affect one another by the mediation of norms and values. The Putnam-type of social capital has two important components:

1. the social network: friendly meetings, visits, relationships with neighbours, social events,
2. civil commitment: the willingness to participate in communities, expression of opinion, relationships between members, participation in elections, etc.

Thus, social capital is in itself made up of complex structural elements (social networks) and complex cultural components (social norms, trust, and willingness to participate).

5. Network economy

Networking can be perceived not only on the level of individual social relationships, but it now integrates the economic system as well. So much so that studying the economic structure of the information society is only possible through networking (Kelly, 1998). The economic structure of the information society is called the "network economy". The term network economy signals that the creation of products and services, the creation of value, take place within the networks themselves. The reason why networks operate successfully is that in the new social and economic environment, networks are able to efficiently create knowledge and process information, they are also able to adapt quickly to the rapidly changing global conditions, flexibly adjusting to altered conditions (Castells, 1996).

In former, industrial economic structures, companies organised their activities according to geographical factors, their development depended on traditional elements of capital (industrial machines), while in the centre of the network economy stands human knowledge and the complex system of relationships and information flowing in digital space. The essence of the network, in an economic sense, is the long-term relationship of cooperation between companies. The development of these networks is the result of complicated interaction, the boundary between one organisation and another is less marked within the network. The strength of the network lies in the fact that the bilateral relations between the members are embedded in the network, and their value depends on the value of the network. The greater a network is, the more valuable it is (Shapiro–Varian, 2000). The various participants in these networks – small enterprises as well as large companies, self-employed persons, state, university and company research institutes – all have a place of their own within the network.

The best examples of network production are multinational companies, where the seat of a company, its research and development department and its assembly lines may all be in different countries, and even different continents. In order to be able to exploit the flexibility of the network, a company has to become a network itself. The network operational mode appears not only in respect to territory, but also organisation: the previously vertical organisational model of multinational companies has changed and today the "big ones" mostly play a dominant role in a complex network structure, usually taking smaller companies with them. Strategic alliances between companies have appeared, the essence of these is "cooperative competition" (i.e. *coopetition*). Coopetition[1] is especially important in the case of

[1] For the definition of term see for example Wikipedia: http://en.wikipedia.org/wiki/Coopetition

high-tech companies working with high research and investment costs, for example in the unification of standards.

The strongest networks were created in the field of information technology, reflecting the extensive interdependence of the hardware and software industries. At the end of the previous millennium, several large companies (e.g. *Cisco Systems or Nokia*) owed their competitive advantage and success to having changed to the new network operational mode. From the end of the 1*990s, more and more large companies (among them Hewlett Packard (HP), IBM, Sun Microsystems and Oracle)* started to reorganise their operation according to the principle of networking. Other, more traditional, non-IT companies such as car factories, textile manufacturers, banks etc. also carried out the change successfully.

NETWORK SOCIETY AND SOCIAL CAPITAL

Will the spread of the Internet through information society, enhanced by more ICT tools, confirm the pessimistic predictions of some sociologists that community participation will lessen? Or will the growing use of the Internet and the Web strengthen community participation?

As a consequence of the rapid development of the World Wide Web, around the turn of the millennium, relevant research results were published (Kraut et al, 1998; Nie et al, 2000, 2002, 2003) which showed that the Internet was isolating users even more, tearing them away from their social networks. They were seeing less of their family members, friends and communities because of their increased use of the Internet. Professor Norman H. Nie and his colleagues thought that although *e-mail* was suitable for developing and maintaining relationships between people, if it could not offer the atmosphere of intimate conversations or meetings with a cup of coffee or a beer, then the Internet could be the final isolating technology, which would destroy completely the communities already weakened by cars and television. According to their research (Nie and Erbring, 2002), the more time one spends on the Internet, the less time that person will spend in the company of real live people. According to analyses carried out in the United States on longitudinal databases (Kraut et al, 2004) using the Internet may lead to a drop in the frequency of use of relationships maintained with friends and family members through mutual visits. What is more, this effect is stronger for those who used in the past to have more social connections. All this may result in a whole society becoming more irresponsible and atomised as a consequence of using computer networks (Levine, 2001). Pessimistic researchers think that even if new relationships are formed through the Internet, the majority of these are so-called "weak ties"[2], for *e-mails* is a "lower" form of communication than talking on the phone or meeting in person (Cummings, Butler and Kraut, 2002). The negative effects of information technologies are strengthened

[2] We know from Mark Granovetter's work that weak ties are strong resources as well. Granovetter (1973) distinguishes between strong and weak ties. He regards relationships between family members and friends as strong ties, while by weak ties he means more casual relationships such as acquaintances, colleagues etc. At the same time, as can be seen above, networks become unstable and unpredictable without weak ties, in other words, these actually stabilize the social networks.

by the fact that these promote anonymity and individualism, and thus weaken social norms and trust, and destroy social capital (Kiesler et al, 1991).

All this raises the question of how modern information technology affects social integration, the cohesion of small communities and the partnerships of the individual. Is this once again a new technology, like television once was, destroying human relationships, isolating the individual and weakening the norm-transmitting and controlling role of small communities? The question comes up more and more often in the specialized literature of sociology.

Naturally, there are scenarios representing the positive but utopian view; not all screenplays are negative. Jon Katz (1997) portrays the "network citizen", using the Internet on a daily basis, as a tolerant, freedom-loving type of person, who feels responsible for public affairs and has a strong sense of civic awareness. According to enthusiastic appraisals, the spread of ICT tools strengthens the individual against the state and the traditional hierarchical structures, and offers an unprecedented opportunity for many users to communicate simultaneously with many other people. There is hope that with a comprehensive line of newly developed software, network applications, and community information development programs, civil society and trust between people, democracy built on *deliberative,* i.e. continuous consultations, and functioning with the active participation of the whole society, as well as the institutions of the public, can all be made stronger with the rational, circumspect and innovative use of ICT tools.

Putnam is of the opinion that the changes caused by the spread of television in the lifestyle and time schedule of people are decisive factors in our search for an explanation for the decrease of social capital (Putnam, 2000),[3] regarding the new information and communication technology tools. However, he believes there is hope that by using them, individuals will be able to increase their social capital (Putnam, 2002). The studies by Cole and Robinson (2002) prove that citizens using the Internet do not spend less time cultivating relationships than those who do not belong to the group of internet users, they also have a more positive social attitude and feel less lonely. Wellman and his colleagues (2001) are even more explicit: "The Internet helps individuals to keep in touch with one another, it increases their willingness to participate in organisations, and ensures new possibilities of community commitment. […] The Internet can increase social capital, civil commitments, and this development can be perceived in online communities".

Thus, we can consider social capital as a *private good* on the one hand, and a *public good* on the other (Putnam, 2000). In the first case, it is from individual interest that relationships are built, in the second case, relationships are formed despite the fact that it is not the general public that develops new social connections, but the individuals, yet the whole community gains from the "benefits" of network mechanisms. It is by realizing their common interests that people start to cooperate, the cultural traditions of cooperation differ from country to country, what is more, they might vary even within smaller regions (Putnam, 1993, 2000).

[3] Regarding television, Putnam stresses that a whole generation has grown up that uses television strictly for entertainment, as a background noise, or for "surfing" on the different channels, and not for the purpose of gaining information. It is not accidental that compared to their parents' generation, among members of this young generation, aged 18–29, the inclination for association has dropped radically.

Social capital also has a macro-level interpretation, according to which this type of capital is not primarily a private good, it is much rather a public good, from which everyone can profit. Similarly to other types of capital, social capital is also a resource, so the more social capital the communities have, the more successful a society is, and the stronger an economy is. The extent of cooperation and trust between people is one of the leading resources of economic-social efficiency. It is in fact the measure of success of each economy. Fukuyama (1995), who can be listed among the protagonists of the macro-level approach, argues that the strength and structure of each economy depends on the level of social capital and that all this is related to the spreading of modern information and communication technology tools. In his opinion, the use of computers and the Internet was a lot more successful in those societies that possessed greater social capital even before the digital revolution, whereas the countries lacking trust and connections were not really able to exploit the advantages of ICT tools.

Regarding the diffusion of the Internet, several sociologists examined the effect of internet use on social capital. Following Putnam, Barry Wellman, a professor at the University of Toronto, and his colleagues (Wellman et al, 2001) *distinguish between two forms of social capital. Network capital* is typically made up of those relationships that we cultivate regularly with our neighbours, colleagues, and close friends. This type of capital is one of the major sources of information, the basis of certain services, and the feeling of "belonging somewhere" is also connected to this. The basis of *participation capital* is its role in political formations and charity (NGO) organisations, ensuring an opportunity for individuals to accomplish something within the community, or to formulate their common aims and represent them consistently. Wellman and his colleagues added a third element to the concept of social capital: *community commitment* represents a strong motivation with the help of which social capital can be mobilized more easily. This also implies a sense of responsibility, and contributes to strengthening the identity of individuals.

If we were to ask today's leading sociologists in what way the Internet influences social capital, we would probably get very different answers, some of them the completely the opposite of others. In their study (2001), Wellman and his colleagues explain in detail their positive views regarding the role of the Internet, namely that the World Wide Web offers new forms of contact that significantly enliven human communities. At the same time, since the limits of time and space no longer exist, the newly formed social groups can become stronger.

The standpoint of the arguments of the opposing camp can be summed up as follows: the Internet reduces social capital, the network alienates people and diverts them from their real relationships. One of their most important arguments is connected to time limits: if we were to insert this new activity – the use of the World Wide Web – into the 24-hour-day, then we would inevitably have to reduce the amount of time we normally spend on other activities such as cultivating our local relationships.

Wellman and his colleagues studied the Internet embedded into everyday life, and found that the World Wide Web does not have a direct, one-way effect on social capital. Instead, it rather complements social interaction and helps to maintain existing relationships. From this it can be concluded that the Internet has an effect on network capital as well: the computer and the World Wide Web extends the already existing relationships. *E-mails* or *chats* cannot substitute for personal relationships, they can merely complement them. Analysing the an-

swers given to their surveys, it was evident for them that network communication did not cause the number of personal meetings to increase. Interestingly, the majority of internet relationships developed between people who lived maximum 50 kilometres from one another. Communication was most intensive in cases where distance kept people apart, and deeper, friendly relationships could only be maintained via the computer.

Taking into consideration the way relationships develop, Wellman and his colleagues came to the conclusion that the Internet has a complementary effect on social capital, in other words, neither the anti-utopians – projecting a dark image of an atomised society of alienated computer users –, nor those who herald the new society's bright future are right.

Apart from studying the changes to social capital, Wellman and his colleagues (2001) pointed out that the World Wide Web increases participation capital considerably. The more time someone spends using the Internet, the more they are involved in things being organised *online,* or in political activities. This phenomenon could be observed among previously active participants of political life, and also among citizens who were less active in public life *offline* outside the Internet and the network.

VIRTUAL SOCIAL NETWORKS

1. Social software

With the spread of internet technology, many new opportunities arose for communicating and gaining information. New kinds of software are at our disposal, with which we can express our opinions, cooperate with others in discussing a question or problem, reflect on the remarks of others, or ask for someone's help regarding something. Through the mechanisms of dialogue, these softwares promote the creation and operation of collaborative social networks. Today the abbreviation of World Wide Web "WWW" could easily be World Wide Words, for *e-mail* and the various instant messaging softwares. **Web 2.0** applications can all promote cooperation between people and the creation of *online* communities more than ever before.

The expression social software first appeared at the beginning of the 1990s, but it is only now, strictly speaking, that it has won its true meaning.[4] Even if it does not yet have a generally accepted definition, by social software we mean software that makes collaborative behaviour, the organisation and moulding of communities, self-expression, social interaction and feedback possible for individuals. It ensures these possibilities in a horizontal structure where there is no institutional framework, there are no relationships based on superiority and inferiority, nor control. Another important element of the existing definition of "social software" is that it allows structured mediation of opinions between people, in a centralized or self-regulating manner, from the top down or from the bottom up (Coates, 2003). The different social network "ports" (for example MySpace, Facebook, Orkut), blog services (e.g. LiveJournal, Xanga, Blogger), the tools used for so-called *tagging* (e.g. *del.icio.us, Digg),* and the media-sharing homepages (e.g. *YouTube, Flickr*) can all be listed under the

[4] Naturally, similar software (e.g. *Well, BBS, Usenet, MUD, IRC*) was used even in the period before WWW, but their social adaptation was still of little consequence.

group social software. These services have several common elements, such as conveying content generated by users, graphically representing the relationships between users, ensuring public communication forums and continually monitoring user behaviour.

1. Table. Types of social softwares

Software	Example
E-mail	*Outlook, Sendmail, Pine, Hotmail*
Weblog, Wiki	*Movable Type, Blogger, Wikipedia*
Messenger systems	*ICQ, MSN, Trillian*
Document editing systems	*Groove, Hydra, Lotus Notes*
Group diaries	*Livejournal*
Introductory systems	*MeetUp, Udate, Ryze*
Systems for organising group discussions and exchange of views	*SmartGroup, BBS, Usenet*

Source: Davies, 2003

Choosing and using the appropriate tools is greatly influenced by the size of the group intending to use the given service (Davies, 2003 and Mayfield, 2003b). This may influence how the different types of social capital may become stronger by using them. While the software of *Instant Message* or *ICQ* is more suitable for dialogue, the bulletin board or new group is better suited for larger groups of up to 100 people.

2. Table. Social software according to the size of the group:

1–2	2–20	20–150	>150
Correspondence, Conversation	Circle of friends	Interest group	Connecting strangers
E-mail	List of friends	*E-mail* address list, *Chat*	*Google*
Instant Message (IM)	*E-mail*	Newsgroup	*Amazon*
e-postcards	*Smartgroup*	*Weblog*	*Yahoo*
ICQ	*Evite*	*Bulletin board*	

Source: Mayfield, 2003b

“Social softwares” can only function effectively if they keep in mind the social context (e.g. the size of the group) that they are to be used in. If the application is successful, the *online* social networks become surprisingly similar to the *offline* networks.

2. Web 2.0 revolution

The fashionable, yet controversial recent concept, Web 2.0, was proposed by Tim O’Reilly (O’Reilly, 2005). The expression “Web 2.0” refers to second-generation internet services that are built on the activities of *online* communities; more precisely on the contents pro-

duced by the users and on sharing them. From a technical point of view, Web 2.0 applications operate on a simple, user-friendly principle; there is no need for special (programming) knowledge for someone to be able to create content and publish it on the World Wide Web. The significance of this is, primarily, that the content becomes important as opposed to the technology.

Before the appearance of Web 2.0, one of the characteristics of services was that the contents that users read, listened to and watched – similarly to the traditional, one-way media – were created by only a few creators. Contrary to this, the essence of Web 2.0 is that the contents are created and shared by the users themselves. According to Tim O'Reilly, the services of Web 2.0 could best be understood by comparing them to the possibilities of the original World Wide Web (Web 1.0). A good example of this is Web 2.0 *Google AdSense,* which is based on the advertisements of small businesses and small consumers, while DoubleClick deals with larger advertisers. Another good example is *Wikipedia,* which is open-sourced and can be edited by anyone, as opposed to the traditionally edited encyclopaedia, the *Britannica Online,* or *BitTorrent,* which shares music recordings, taking the services of *mp3.com* to a higher level. It can be clearly seen that a new kind of user demand has become dominant, *RSS feed* (ensuring immediate access to fresh news) takes the place of static news, the democratic "labelling" by users takes the place of the traditional (authoritative) classification of contents, which leads to community classification.

3. Table. Comparison of Web 1.0 and Web 2.0

Web 1.0	**Web 2.0**
DoubleClick	*Google AdSense*
Ofoto	*Flickr*
Akamai	*BitTorrent*
mp3.com	*Napster*
Britannica Online	*Wikipedia*
Personal websites	Blogging
Evite	*upcoming.org, EVDB*
Domain-name speculation	Search-optimization
Page views	Cost per click
screen scraping	Web services
Publishing	Participation
Content management systems	Wikis
Directories (taxonomy)	Tagging ("folksonomy")
Stickiness	*Syndication*

Source: O'Reilly, 2005

According to Tim O'Reilly, Web 2.0 is not simply a new technology or tool, it is a platform that has no distinct borders, only a "gravitational nucleus", which requires a new kind of attitude from the user. It is evident that the concept itself is still immature. However, in practice it works and is constantly renewed.

Those who criticize Web 2.0 usually make these judgements from a number of different points of view: the concept of Web 2.0 has not been defined properly. What is more, there is

nothing new in it compared to what the World Wide Web represented earlier: we are describing the same interactive space that connects people (Anderson, 2007). Several characteristics that supporters of Web 2.0 label "new" have actually existed previously[5], and these technological innovations have not changed the operating principles of the World Wide Web. They are merely supplementary.

By referring to the "dot.com" bubble, several analysts remind us that Web 2.0 can easily become a second burst "bubble". A profusion of "Web 2.0" companies are appearing on the market, offering the same services, and without a serious business model behind them. According to Josh Kopelman (2006), only about fifty thousand people are really interested in Web 2.0. His estimate derives from recorded blog-entries – the number of registered members listed on *TechCrunch,* dealing with Web 2.0 was 50 thousand. He suggests this is not sufficient for economic viability.

SUMMARY

With the development of the information society and its technical expertise, the subsystems of society are operating more and more like a network. Instead of natural resources, after the second half of the 20th century, information and access have become the most important economic and social organising forces. From the 1960s information has been produced, processed and distributed with the help of modern information and communication technologies. According to Manuel Castells, technological changes first reshaped the economy, by the turn of the millennium, however, the systems of society and politics, and the subsystems of culture had also changed radically. In Castells' view, three decisive conditions must be met simultaneously for competitiveness to increase and for successful social changes to take place. Network society builds on the development of technology and on innovation, on a flexible, well-qualified workforce and on a network organisational form adapted to the new operational model.

Social scientists perceive that closer ties with neighbours and relatives form a central part of interpersonal relationships, but now the development and maintenance of community networks is also made possible by the automobile, the aeroplane, the telephone and the Internet. In the main, these earlier technologies make it possible to maintain relationships across great distances, but the functioning of communities is not only made possible through strong ties between neighbours, relatives, close friends and colleagues. Looser connections are just as important because through them, we are able to bridge greater social and geographical distances.

Barry Wellman and Milena Guila (1999) point out that we must go beyond the definition of space-centred, neighbourhood-based communities, towards a definition based on partnership networks: "Analysts of social networks must teach those sociologists who still think of traditional local communities, that the borders of a community reach well beyond the actual dwelling area. Members of virtual communities, however, consider it evident that computer networks are also partnership networks, bridging great distances." (Wellman–Guila, 1999: 3).

[5] A good example of this is *Amazon.com,* which, from the year 1995, when it was started, made it possible for its users to publish information sheets and guides themselves.

If, we see that modern societies suffer from weaker relationships, that is they work less like networks, but we see that interactive technologies are becoming more and more widespread in society, then perhaps we can ask whether the Putnam logic can be reversed? Can the increasing use of ICT tools promote the growth of social capital through the willingness of individuals to form partnerships and make civil commitments?

Based on the results of the studies discussed earlier the answer at the moment is yes rather than no.[6] This cautious approach seems justified despite the often positively promising research results. The Internet is a very new technology, it is constantly changing, new technological solutions and applications appear all the time and spread incredibly fast. Nowadays, broadband networks, wireless tools promoting mobility and Web 2.0 are all forging ahead, so researching their effect on society offers continuous opportunities for further studies. Another reason why it is dangerous to generalise too greatly from recent evaluations of the real effects of the Internet on the wider society is that it has reached the stage of complete diffusion in only a few countries. In 1995 and 1996, when only 40% of all households in the United States had computers and the Internet was only accessible in 30% of all households, Robert Kraut and his colleagues (1998, 2002), wrote, based on their then experimental investigations, that the Internet was an antisocial technology, and that its use caused social separation and depression in users. In 2002, however, the results of repeated, later, surveys showed that the connection between internet use and social participation was positive rather than negative.

More often than not, researchers analyse the spread of internet use as an isolated social phenomenon. They often may not take into consideration how the interactions being realized through the Internet fit into the everyday life of people. The growing number of applications of the World Wide Web offers people opportunities for contact, and this does not mean another "reality", because the users take with them, to their *online* interactions, their sex, their age, their habits, their culture and their social-economic situation as they do in their *offline* relationships (Wellman–Guila, 1999). For this reason, virtual social networks are also real; that is, the Internet is the largest and most comprehensive social network (Wellman, 2001).

Networking has become the foundation of the new economic structure of information society, where human knowledge and information-flow in digital space and the complex system of connections take the place of traditional elements of capital. The essence of the network can be grasped in the long-term relationships of cooperation and coopetition between economic operators. Networking appears not only among independent organisations, but also within individual organisations as well. Relationships of subordination and superordination are increasingly replaced by horizontal organisation.

"Web 2.0" offers second-generation services in which the contents are produced and shared by the users themselves. In the beginning the contents made accessible on the Internet were created by relatively few creators, but following the "revolution of Web 2.0", the users have become the creators of contents. Critics of Web 2.0 warn us about the new services, and they also question the claims of novelty for these services. In their opinion, the concept of Web 2.0 has not been properly defined, and compared to the original concept of the World Wide Web. Essentially there is nothing really new in it.

[6] To the question of whether regular internet use reduces the amount and quality of relationships between people, and the extent of civil commitments, we can answer with a definite no.

REVISION QUESTIONS

1. In which social areas did the effects of network society first appear?
2. Which three important trends does Manuel Castells draw to our attention in connection with changes to the mass media?
3. What are the criteria for recognising a company operating according to the principle of networking?
4. In the age of the Internet, what methods might you use to examine the distance (in steps) between two people who do not know each other? What did Milgram do in the original experiment?
5. According to research results, does using the Internet regularly increase or decrease the number of relationships a person has?
6. How many components of social capital does Barry Wellman distinguish between? How is each of them connected to Internet use?
7. Compare the services offered by Web 1.0 and Web 2.0.

BIBLIOGRAPHY

1. Key bibliography

Castells, Manuel (2006): The Network Society: from Knowledge to Policy (in: Manuel Castells – Gustavo Cardoso (eds.): *The Network Society: From Knowledge to Policy,* The Johns Hopkins University Press, Center for Transatlantic Research Relations, Washington, DC)

Putnam, Robert D. (2000): *Bowling Alone. The Collapse and Revival of American Community* (Simon and Schuster, New York)

Milgram, Stanley – Travers, Jeffrey (1969): An Experimental Study of the Small World Problem (in: *Sociometry,* Vol. 32, issue 4, pp. 425–443.)

2. Optional bibliography

Barabási, Albert-László (2002): *Linked – The New Network of Science: How Everything Is Connected to Everything Else and What it Means* (Perseus Books, Cambridge MA)

Castells, Manuel (2000): Toward a Sociology of the Network Society (in: *Contemporary Sociology,* volume 29, issue 5, pp. 693–699.)

Gillmor, Dan (2004): *We the Media: Grassroots Journalism by the People, for the People* (O'Reilly, Sebastopol, CA)

BENCE KOLLÁNYI

Use of space in the information society age

INTRODUCTION

The first part of this chapter is devoted to the changes in mankind's relation to space, highlighting those milestones that facilitated the mapping of the world and the rapid overcoming of physical distances. The technology that was necessary to make these achievements possible – for example information and communication technologies and rapidly developing means of transportation – were a prerequisite for **globalisation** to take place, a process that first led to the discovery of the world, then to its more extended exploration and eventually to its actual transformation.

The next part takes a brief look at how the spreading of information and communication technologies gave rise to a new world, the three most important characteristics of which are globality and the emergence of network operation and of a global media culture. All these three characteristics are linked to some extent to humankind's relation to space and time: as a result of globalisation the significance of space changes; under the influence of technology the effect of physical distance is gradually decreased; the presence of the media promotes spatial perception and instancy, and it is network operation that creates the organisational framework for economic players and thus provides and enhances the conditions required by global production and economic operation.

Finally, the concepts of **virtual reality** and **cyberspace** will be reviewed, the latter one being closely linked to science fiction, since even the expression itself was coined by William Gibson in his book *Neuromancer* (Gibson, 1984). The chapter will conclude with some thoughts on the possible practical applications of virtual reality.

CHANGES IN THE BUILT ENVIRONMENT – THOUGHTS ON THE SOCIO-HISTORICAL APPROACH TO SPACE

1. Physical space in transformation

Throughout its history mankind strove to discover and conquer the space it was surrounded by. Eventually, all corners of the Earth were discovered by the various civilisations, and the development of the means of transportation drastically decreased the importance of physical distances. Accordingly, the boundaries of physical space expanded driven by technological

development, as the time required to overcome distances was reduced to a fraction of what it had been originally.

The great explorations of the 15–17th centuries created the Globe as we know it today. The proportion of its geographical areas known to European civilisation and then conquered by European interests increased 100-fold over a period of some 100 years. In this expanded space the time taken to get from one place to another was reduced to a fragment of what it had once been[1] by the rapid development of transport technology. While it had taken several days to cover 100 kilometres on foot, the same distance could be travelled in a matter of one or two hours by train and steam engine, the two signature inventions of the industrial revolution.[2] The next fundamental advance was the emergence of the automobile, bringing about an increase in the individual's freedom of space.

It was most probably automobile transport that brought about the most significant change in the 20th century in regard to the social significance of space. There is a complex system of technological and social changes that is linked to the automobile. John Urry (1999) examined six components when he wrote about the car as

- the result of a production process,
- the object of individual consumption,
- a mechanical apparatus,
- the means of private mobility,
- a cultural factor,
- and the user of natural resources.

The development of automobile transport in America is closely connected to the construction of the unified network of interstate highways linking towns and cities. Work on the almost 70 thousand kilometres of road network began in 1956, and the costs were financed from the increased tax that was built into the price of petrol.

The role played by the interstate highway network points beyond that of simple infrastructure, since it has become a cultural icon, primarily as a result of the television and film industries. Motoring has even created its own film genre, and these films have played a major part in giving a strong social significance to this form of travelling.[3]

Travelling by car assumed a fundamental role in regard to the impact of globalisation on everyday life as well as the emergence of the network society. Urry calls attention to several social effects that are closely linked to motorised transport.

- The workplace and the home have become separated since transportation is often done by car or public transport.

[1] Paradoxically, this also meant that time spent travelling increased on average because people travelled more. Travelling became a custumary activity no longer considered dangerous as it was before. Thus, the same distance could be covered within a shorter time than earlier but on the whole people did not actually spend less time travelling.

[2] Provided that there was a rail line in the given area. Otherwise, the distance had to be covered on horseback, with horse-drawn carts or on foot.

[3] Some films in the Road Movie genre include Easy Rider, Duel, and Thelma and Louise.

- Members of the same family live far from one another and regular family reunions can only be realised by overcoming physical distances which puts a strain on infrastructure especially during holiday periods.
- People can seemingly save time by using the various means of transportation; however, they often get caught in traffic jams and are delayed.

Another compelling feature of the development of transportation networks is that the building of road networks led to much more efficient channels of transportation which significantly reduced relative spatial distance. However, those that cannot access these channels are put at a disadvantage greatly (Brunn–Leinbach, 1991; quoted in Urry, 1999). Thus, modernisation and the uneven development of transportation networks gave rise to new types of inequality.

One efficient way of decreasing these inequalities might be through the dissemination of information and communication technologies; for example, these technologies can provide access to information regardless of physical closeness to the traditional channels, which is even in the smallest settlements.[4]

Interestingly, the emergence of the information society coincides with man's expedition into space. One of the first milestones of mankind's conquest of space was the launch of the Soviet satellite Sputnik-1 in 1957.[5] Today's satellites used in telecommunication, localization and in television broadcasting would also not exist without space exploration, and information society would be different if Sputnik had not been launched.[6]

In order to understand the changes that were brought about by technological development in people's sense of space and the social use of space, it is important to consider the process of urbanisation as an antecedent. Urbanisation denotes the process whereby a significant proportion of those living in villages flood into towns and cities, thus increasing their population, while at the same time the quantity of local services in villages expands and its quality is improved. The expansion of towns and cities is made possible by the (sub)urbanisation of its environs and is necessitated partly by the increased demand for labour and the decreased demand for agricultural work.

At the turn of the 19th and 20th centuries only 13% of the Earth's population lived in towns and cities. According to "World Urbanisation Prospects" published by the UN in 2005, by the 1950s the proportion of people living in towns and cities grew to 29% and nearly 50% of the world's population lived in towns and cities in 2005.

Conquering physical space was accompanied by a shrinking of nature. Giant metropolises developed all over the world and they are becoming increasingly great. Since the 1990s

[4] However, the emergence of these devices did not put an end to social inequalities. What is more, it created new ones. Elisa Mancinelli's chapter addresses this issue in more detail.

[5] Of course the conquest of space can be traced back before this date since the V-2 rocket was successfully launched into space by Nazi Germany in 1942, although their aim was not to explore the universe but rather to destroy various terrestrial targets.

[6] It must be mentioned that ARPA (Advanced Research Projects Agency), a pioneer in the field of Internet development, was established as a reaction to the "Sputnik shock"; it was part of the package that Americans worked out in response to the launch of the Sputnik.

the biggest cities have been called megalopolises when their respective populations exceed 10 million and their population per square kilometre reaches 2,000. Such megalopolises include Mexico City, Seoul in South Korea and New York.

2. Global communication

The industrial revolution generated the acceleration of transport, which was a primary turning point in developments to overcome physical distances and achieve the faster movement of goods and people. The information revolution that emerged in the second half of the 20th century brought about a sudden rise in the speed of information flow, which directly affects people's notions of space.

The latter part of this chapter will explain how the emergence of the media and the acceleration of the information flow enable people to be aware of events taking place in every corner of the world that has been conquered by mankind. Consequently, the proportion of information an individual possesses about areas that lie far from their own physical environment significantly increases in each individual information household.

For thousands of years mankind has been preoccupied with the idea of making the communication of information simple and fast, possibly without human participation (couriers) in the delivery of information in order to get messages to their destination more rapidly and safely. Information flow based on message forwarding networks already appeared in ancient empires, but it is enough to go back to the 18th century to understand the formation of modern information and communication networks. In 1792 after the French Revolution Claude Chappe introduced his invention called the semaphore, or optical telegraph. This apparatus, regarded as the first telecommunication system, was based on the forwarding of visual signals between towers that were erected from 12 to 25 kilometres from each other. Each tower was fitted at the top with two-branched flags with seven positions on both sides, which were read by the operating staff in the next tower with telescopes. This system was able to transmit message fragments of two words per minute. Thus, it would have taken almost fifty minutes for an average text message (of 25 words) to be transmitted from Paris to Lille, which was 190 kilometres from it, along the first semaphore line.

In the course of about one hundred years the network of semaphore lines spread throughout the whole of France. Napoleon established a huge semaphore network and, among other things, kept his empire under control and organised the command of his army by means of these towers. Encouraged by the success of the French, similar networks were built in Great Britain, Germany, and in others countries, while Russia was linked with Poland in this way too.

1. Table. Cost of the semaphore and the electric telegraph at today's prices

Country	Semaphore line (120 miles)	Electric Telegraph line (120 miles)
Number of towers/network	15 towers ($1,500,000)	Poles and wires ($1,800,000)
Number of operators	at least 15 full-time operators ($450,000 per year)	At least 6 full-time operators ($180,000 per year)
Maximum period of use	10 hours per day	7 days/24 hours
Speed	2 words per minute	15 words per minute
Cost of sending 100 words	$1.14 (at 10% mark-up)	$0.03809 (at 10 % mark-up)

Source: Wikipedia (Semaphore)

The real breakthrough in communications was the birth of the global communication channels spreading across the entire globe. The Electric Telegraph originated by Francisco de Salva, whose system, developed at the end of the 18th century, was able to transmit sig- nals electronically. The further successful development of the system was carried out by American inventor Samuel Morse. The first trans-continental telegraph system connecting the east and west coasts was installed in the United States in the autumn of 1861. A few years later, on 27th July in 1866, the first trans-Atlantic telegraph network connecting the United States with Europe started its operation. By the end of the 20th century a global communica- tion network spreading to every continent was established.

British historian Arnold J. Toynbee claims that mankind became connected in regard to information and communication (the creation of global interconnectivity) thanks to the international postal system. As he states, *"as regards communication […] world-society has existed for a century with its emergence dating back to the establishment of the international postal organisation in 1875."* In fact, Toynbee regarded the increase in correspondence as the most crucial factor in this process since its rate of growth exceeded the worrying increase in the size of the population (Toynbee, 1971: 385, quoted in Z. Karvalics, 2004: 39).

To sum up, globalisation brought about cultural, economic and political changes alike. In connection with the last, Armand Mattelart, a French theoretician on information society, remarks that the globalisation of politics was first recognised by American president John F. Kennedy when he stated that "in a sense the whole world can be regarded as an issue of interior policy" (Mattelart, 2001).

3. Time-space compression

The changes in space and time cannot be understood independently of social change. David Harvey uses this principle, among others, in his work when he analyses *time-space compression* in connection with post modernity. Harvey claims that social space gradually compresses into a "global village", in which process telecommunication plays a prominent role. This is accompanied by an unprecedented acceleration of time (Harvey, 1990).

The transformation of global space is well indicated by the technical revolution in transport that started in the Middle Ages and with the development of aviation by the 1960s al-

lowing even civilians to travel at a speed of nearly 700 m/h, i.e. more than 1,100 km/h, which amounts to a seventy-fold increase compared to 1500. Harvey's data can be found below:

2. Table. Increase in the speed of means of transportation since 1500

Period (year)	Means of transportation	Speed (km per hour)
1500–1840	Horse-drawn carriage, sailing ship	16
1850–1930	Steam engine, steamboat	Steam engine: 104 Steam boat: 58
1950s	Propeller plane	483–644
1960s	Jet-propelled passenger plane	805–1127

Source: Harvey, 1990

It can be seen that innovations in infocommunication (e.g. the telegraph, the radio, the telephone) do away with earlier limitations and bridge physical distances, in many cases making personal presence unnecessary. Furthermore, transportation technologies enable people to get from one place to another simply and fast if personal presence is necessary.

4. Interconnectivity

According to Castells, one of the greatest achievements brought about by the information society is the strengthening of global **interconnectivity** (Castells, 1996), that is, the system of mutual social relationships; for example, a fast motor highway network linking towns and cities enables interconnectivity as will in future high speed rail links.

Interconnectivity may be represented at a solely technological level too. The principle of interconnectivity in electronic communication means that in a network – which can be a sonic telephone connection or a network of computers built on digital data – a user has the opportunity to communicate regardless of whether he uses the networks of one or more service providers to establish the connection (Kariyawasam, 2001, quoted in Paliwala, 2006). In the case of the Internet, interconnectivity is provided through various services, for example by email).

It is interconnectivity that makes the Internet a global network. It is one of the fundamental principles of the network industry that the value of a network grows in direct proportion to the increase in the number of users that are connected to the network (Correa, 2001). This is especially true for telecommunication networks.[7]

[7] This is well illustrated by the use of fax machines: the first buyer who purchased one fax machine got hold of a technology that he could not use for communication. He had to buy at least two devices that he then used between two companies' seats.

USE OF SPACE IN THE INFORMATION SOCIETY AGE

In this, our analysis of information society from a spatial perspective, the global society that emerged as a result of advanced communication and information technologies is characterised by interconnectivity and networks developing between physical spaces and people.

However, the network mode of operation and the transformation of physical space only characterises a limited aspect of the information society, which developed as a result of the complex processes that took place in the 20th and 21st centuries. In the exhilarating study which introduces the first chapter of his book *Theories of the Information Society,* Frank Webster presents five information society approaches with spatial structure theory being one of them (Webster, 1995). The British sociologist observes that in theories of spatial organisation the emergence of the information society is linked to the changing use of space and globalisation and the qualitative change that fundamentally differentiates the information society from society in the industrial age is attributed to same social and technical forces.

1. The revaluation of physical space

The development of the information society runs parallel with the diminishing part played by physical space. Engineer and informatician Nicholas Negroponte, the founder of the Media Lab research centre at MIT, drew a comparison between industrial society and the information society. As early as 1993–1998, he wrote about the movement of bits in his regular column in the American *Wired Magazine* promoting digital culture. By way of illustration (often quoted in scientific circles) he called the industrial society the **age of atoms**, while he denoted the information society the **age of bits**. His book published 1995 is in many ways a reiteration of his popular magazine articles. He writes about the change that is taking place as follows:

> "The industrial age, very much an age of gave us the concept of mass production, with the economies that come from manufacturing with uniform and repetitious methods in any one given space and time. The information age, the age of computers, showed us the same economies of scale, but with less regard for space and time. The manufacturing of bits could happen anywhere, at any time, and, for example, move among the stock markets of New York, London, and Tokyo as if they were three adjacent machine tools." (Negroponte, 1995).

Negroponte defined the difference between the two ages comparing the differences in the modes of production and in the type of goods produced. It is, therefore, no coincidence that he cites an example from the international money markets since this sector became international most rapidly with its operation having become network-based and entirely global.

It can be said that the effect of network society first manifests itself in the economic sector and within that in industries associated with financial and information management. Manuel Castells saw the effect of the network model in a similar way (Castells, 2006) when he states that network society initially appears in technology and economy. However, he goes beyond this and claims there is far more happening here since social and cultural effects also appear,

albeit 10-15 years later; however, all social sub-systems had changed fundamentally by the end of the 20th century.

Negroponte says that development in the network society surpasses geographical boundaries entirely. Thus, the digital way of living depends less and less on where we are at a given time or what time our watches show. He believes it is predictable that geographical places will be "moved" in the future and it will be possible to perform an operation from a distance, for example, thanks to the development of telecommunication and virtual reality.

In medical science, as in other areas, the development of information and communication technologies has greatly contributed to lifting more and more limitations that result from physical distance. As an example, the Republic of Mali in West Africa, a former French colony, has only one medical university, operating in the capital. Therefore, training and consultation programmes provided through the Internet seemed to be the best solution for the country. The African state, twice the size of France, established the "eHealth in Africa" network with professional support from the Hospital of Geneva University. Later, several other African countries joined the project. Adapting to the reality of small bandwidth, the programme provides effective assistance (video materials for learning, consultation opportunities, knowledge base) for young doctors working in the disadvantaged rural areas too (The RAFT Network, 2007).

2. Global production and use of space

The development of information technologies and the process of globalisation go hand in hand. Globalisation is in fact not simply about bridging geographical distance but far more than that. Anthony Giddens explains globalisation as the result of a process of deepening social ties that connect previously separate communities (Giddens, 1997).

Social processes have pointed towards globalisation ever since the beginnings of mankind. The Global Scenario Group, founded by the Stockholm Environment Institute, presents this change in four stages:

3. Table. Stages of globalisation throughout the history of mankind

	Stone age	**Early civilisations**	**Modernity**	**Global age**
Organisation	Tribes/village	City state/kingdom	Nation state	Global governance
Economy	Hunting and gathering	Agriculture	Industrial production	Globalisation
Communication	Language	Writing	Printing	Internet

Source: Global Scenario Group, 2002

It is clear that in addition to the economy, the organisation of communities, the political system and the method of communication also felt the same forces of change over time. Processes of standardisation and compression affected all three areas: local social and economic institutions were gradually replaced by increasingly supranational and global systems.

Economic change is compelled by multinationals gaining ground. These companies are often present on more than one continent at one time and in many cases production, management, sales as well as research and development functions are shared between the various branches. This type of production and sales method that encompasses the entire globe could not have happened without the explosion of information and communication technology development.

According to American economist and sociologist Saskia Sassen technological development, economic transformation and the globalisation process – in a broader sense – have led to a profound change in spatial structure (Sassen, 2000). Exploring the social impact of information technologies she argues that depending on the mode of production companies have varying degrees of freedom in deciding about the physical location of their business functions. Having reviewed the practice of the past ten years she differentiated three types of globally active companies.

Firstly, there are those companies that deal with products that are mass-produced with standardised methods. They have a far greater degree of freedom in choosing their production sites than before. In regard to establishing the production chain the role played by geographical distance is diminishing, typical examples of which include data entry and simple assembly work, which are no longer specific to big cities. In such cases, therefore, labour cost is the most important factor when the decision about location is made. These types of companies do not necessarily set up their centre in a big city but often in suburbs, industrial parks or the environs of small towns.

The second major type based on a similar pattern are those big companies with a vested interest in global production that need to carry out more complex organisational and management tasks than the companies in the first category. They often use special network services in order to perform these tasks and outsource some of their managerial tasks, thus granting themselves more freedom to choose the location of their central offices.

The third type of company includes highly specialised businesses providing network services. They maintain intensive connections with other companies and the provision of the information flow for others is their special priority. Companies providing financial services belong to this type for example. Sassen noticed that these companies are more place-specific than it could be assumed at first based on the mobility associated with their activity and the products they produce.

Sassen says that choosing a location has remained an important factor even in today's global and digital economy. However, the old schemes and patterns of using space are no longer valid. While centres used to be typically located in big cities, and within that in business centres, today companies have appeared which have management tasks shared between centres in different locations through new communication networks in addition to companies with one centre. The centres that are geographically separate are linked up into a network. Sassen claims that along with the processes of globalisation taking place some locations gain special significance and certain big cities become global cities. This is the reason why some international giants set up their centres in places like London, New York, Sydney and Hong Kong.

FROM CYBERSPACE TO VIRTUAL REALITY

The term cyberspace was coined by science fiction author William Gibson from the words cybernetics and space. He first used the term in his short story entitled *Burning Chrome,* published in 1982, and it was made known worldwide by his famous novel Neuromancer (Stanovsky, 2004). Gibson uses cyberspace as the visual manifestation of computer-stimulated reality, or the graphic representation of data flowing through computer networks. He explains the essence of cyberspace in *Neuromancer* in the following way:

> "Cyberspace. A consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts. […] A graphic representation of data abstracted from banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding…" (Gibson, 1984).

The concept of cyberspace, as Hayles points out, was born out of nowhere. On the one hand, Gibson reacted to those technological and social changes that shaped people's worldview in the 1980s and 1990s (Hayles, 1996), and on the other hand he revisited the research that had been carried out in cybernetics in the preceding decades.[8]

In *Cyberspace Handbook* (Whittaker, 2004) three geographies of cyberspace are distinguished, based on Manuel Castells and Matthew Zook. The focus of technical geography is basic infrastructure, i.e. the network enabling the flow of information. The geography that focuses on a users' spatial position reflects upon the place they occupied in the physical or social network. Lastly, economic geography deals with production linked to information technology, such as the activities of Silicon Valley or those of the electronics factories in Southern Asia.

The first successful application of virtual reality can be found in the American army and the Americans space research institute NASA (Stanovsky, 2004). The objective of military innovations was to provide through "simulations" as realistic as possible training for pilots. The next phase of virtual reality innovations was in the entertainment industry, where the objective was again to experience a true-to-life sensation, not for learning but for leisure purposes. Stanovsky quotes the early *Cinerama* (wide screen film recorded with three cameras and projected with three projectors) of the 1950s as being one of the roots of VR, alongside development of the stereo sound and experimental 3D films in the struggle to resist the effects of TV on the film industry.

However, virtual reality offers more than just simulation and a new form of entertainment: in many cases new community spaces can be set up with its help, where users get in touch with each other in a computer-generated simulated environment. This virtual space can equally be based on imaginary locations and can be the exact representation of real places. Virtual reality may also be based on a model created with (three dimensional) com-

[8] Cybernetics as a scientific term became known as the umbrella term used for new interdisciplinary research that appeared in the 1940s. Contrary to widespread belief, cybernetics is not directly linked to computer science since its focus of interest is how mechanical/digital devices and living organisms process information and how they react to it (see e.g. Wiener, 1948).

puter graphics. Furthermore, a text description of virtual spaces, such as the description of places in an imaginary city that users can enter, may also be regarded as virtual reality.

Multiplayer games enacted in virtual spaces are another important example among the computerised versions. The MUD (Multi User Dungeon) is a combination of role-playing games, online chat rooms and computer games. The largest free online community encyclopaedia Wikipedia devotes several entries to MUDs. Interestingly, the history of online games can actually be traced back to the academic sphere since the first game was launched at the University of Essex in England at the end of the 1970s.

In his study detailing MUDs (Curtis, 1992), Pavel Curtis, one of the former leading inventors at Xerox's research centre in Palo Alto, points out that in online role-playing games the players communicate with each other in real time and the customary forms of communication are valid in the network. As he says, MUDs are software allowing access for many users to a special database with the help of some kind of network during which the connection can be realised through a telephone call and the internet. The shared database contains the "rooms" of the game, the users' data and other information. According to Curtis, MUD belongs to virtual reality because it is an electronic space that users can visit.

Today multi-player online role-playing games operate through graphic interfaces, in online visual worlds. MMORPGs (Massively Multiplayer Online Role-playing Game) often referred to as the new generation MUDs, have a global membership of millions of users. MMORPGs have created special community spaces with some of them having their own economic rules and the most important resources are often sold for real dollars instead of virtual currency.[9]

Players are offered more advanced versions of virtual reality while at the same time technology is utilised in a growing number of other areas, too. Education was an important area of use at the very start. In some experimental projects conducted in the United States in the 1990s virtual reality was introduced to schools. This technology is employed in medical science. For example, phobias linked to fear of depth or heights are cured in virtual environments, but the technology has also been used in the psychological treatment of soldiers returning from combat in Iraq. Furthermore, several uses of VR are known in the areas of commerce, e-administration services, medical science and those forms of fine arts that are open to technological change.

SUMMARY

When exploring physical space we can see how in the past period of great geographical explorations the world seemed to expand. As a result of urbanisation the majority of the Earth's population now lives in towns and cities, and it is as a consequence of this urbanisation that the degree of interconnectivity has increased. Today those parts of the world that are situated at great distances from one another are not so isolated since they may mutually exert influence on one another economically, culturally and politically through network technology.

[9] Two of the most popular MMORPGs are Second Life (http://www.secondlife.com) and World of Warcraft (http://www.worldofwarcraft.com).

On the other hand, the development of transport and the rapidly spreading communication technologies have also led to a shrinking of the world which has had the same effect as diminished physical distance. A good example of this is that the speed of means of mass transportation increased 70 fold between the Middle Ages and the second half of the 20th century.

Starting from the end of the 18th century, communication networks gradually extended to cover the entire globe and transcontinental lines appeared by the 21st century. At the same time, the costs of communication radically decreased and interconnectivity further enhanced the processes of globalisation.

The use of space in the information age has affected the strategies employed by international companies, worldwide production and sales methods and the bases of the global division of labour. With the development of the network society the role played by physical space decreased, and as Negroponte also pointed out, development surpasses geographical boundaries.

Cyberspace, the conceptual antecedents of virtual reality and its main area of use, must be mentioned first in connection with the new forms of the use of space. Multiplayer computer games, which appeared in the late 1970s, the experiments of the military industry and innovations in the entertainment industry laid down the foundations for VR development.

REVISION QUESTIONS

1. Negroponte called industrial society the age of atoms. What metaphor did he use to describe the information society and why?
2. In which century were the first transcontinental communication networks set up (electric telegraph, international postal network)?
3. Cities exceeding what size of population can be called megalopolises? List three examples from three different continents.
4. What technological developments have contributed to diminish the role of physical distance?
5. Who coined the term cyberspace? What does the term mean?
6. Virtual reality and three-dimensional effects are not only used in the entertainment industry. What practical forms of application can you name in connection with VR?

BIBLIOGRAPHY

1. Key bibliography

Castells, Manuel (1996): *The Rise of the Network Society, The Information Age: Economy, Society and Culture,* Vol. I. Cambridge, MA; Oxford, UK: Blackwell)

Sassen, Saskia (2000): New Frontiers Facing Urban Sociology at the Millennium (in: *British Journal of Sociology* 51: 143–159)

Urry, John (1999): *Automobility, Car Culture and Weightless Travel: A discussion paper* (Department of Sociology, Lancaster University, Lancaster, http://www.comp.lancs.ac.uk/sociology/papers/Urry-Automobility.pdf, accessed 13 July 2007)

2. Optional bibliography

Castells, Manuel (2006): The Network Society: from Knowledge to Policy (in: Castells, Manuel – Cardoso Gustavo (eds.): *The Network Society: From Knowledge to Policy,* Johns Hopkins University Press, Center for Transatlantic Research Relations, Washington, DC)

Gibson, William (1984): *Neuromancer* (Ace Books, New York)

Stanovsky, Derek (2004): Virtual Reality (in: Floridi, L. (ed.): *The Blackwell Guide to the Philosophy of Computing and Information* (Blackwell Publishing, Oxford)

Whittaker, Jason (ed.) (2004): *Cyberspace Handbook* (Routledge, London, New York)

MÁRTON HOLCZER

Innovation and competitiveness in the information society

KEY TERMS IN INNOVATION AND R&D

1. The omnipresent innovation

In the information society, acquiring and producing new information and knowledge are of ultimate importance in the life of a given community or organisation, whether it is a country, a company, a settlement, a region, an educational or research institution. This chapter does not deal with the questions of individual knowledge and individual competences since information management and knowledge management are currently at a level where global competitiveness requires teamwork, i.e. the co-operation of a group of qualified people. In the information society development focuses on a novel way of joining together and applying existing information and knowledge as well as producing new information and knowledge. **Innovation** is the umbrella term used for the activities aimed at realising these processes.

This chapter will deal with:

- the various basic types of innovation in profit-oriented organisations;
- the extent to which the production of new knowledge and skills is linked to science;
- the relationship between innovation and the economic competitiveness of companies, countries and regions;
- the actors through which information and communication technologies influence innovation processes

in the information society.

A distinction should be made between smaller- and larger-scale innovation, the previous being called "small innovation", which is referred to by different authors as "sustaining", "linear", "occurring during production or use", "leading to the gradual accumulation of variations" and "incremental". Such innovation can be realised by using existing competences to make minor improvements; thus, it is like a crossword where we know that there is a solution to the problem and we have a more or less vague idea as to its nature, with the only task being to define the exact path that leads to that solution. In contrast, so-called "big innovation" opens up radically new paths. It includes the element of "original surprise" in that even in the moment of its realisation it is not obvious what potentials it will offer when it is eventually implemented. Thus, the shift in direction that is involved in such innovation is conveyed by attributes such as "breakthrough", "radical", "non-continuous", "non-linear", "disruptive" and "architectural". In other words, the foundation of great innovation is not the refinement of already existent paths.

The main aim of this chapter to examine how the different types of innovation employed by different actors affect the economic performance and competitiveness of a given, delineated community or organisation in an age where we can talk about the mutual evolution (co-evolution) of infocommunication tools and societal existence. The first difficulty we face in this chapter is that actors are hard to define: competition takes place globally as well as at the level of greater regions and countries while we can also talk about specific profit-oriented and non-profit organisations as well as regional and national innovation systems. Furthermore, the scientific researchers, who are the primary contributors of great innovation, more often function as part of a global scientific sphere than as part of a national economy; therefore, in an economic sense their contribution can be utilised at any geographical location.

In the age of the information society, innovation is not a particular, localised activity but arises from our natural, universal need to adapt. In modern times the world has become increasingly knowable and the opportunities for innovation have kept pace with the need to innovate. Once it became possible to encode information in digital form and thence transmit it, *the gathering, arrangement and processing of information has become much easier as has the potential to collaborate in these activities.* At the same time, improvements in the efficacy and power of infocommunication tools, as well as variations in our competence to exploit them, have resulted in significant differences in innovation performance.

In this chapter the concepts of innovation and *competitiveness* are dealt with mainly in an economic context. *The last two decades have brought a significant shift in scientific discourse: the concept of innovation has undergone significant reinterpretation since if social and economic processes are viewed in the context of the information society and the knowledge-based economy, the importance of innovation performance becomes more obvious and perceptible.* The significance of innovation, used in an increasingly wider sense, has been recognised by political decision-makers; thus, this topic has become more of a focus in strategic development. It is therefore essential that the role played by states and other government levels (primarily regions) should be discussed in this chapter, since the activities of these actors are aimed at improving the environment for economic development where the enhancement of innovativity has utmost significance.

2. Types of innovation

The concept of innovation has broadened in the last decade, as new ideas that facilitate business success have been gradually explored and changes have been made. Besides product and process innovation, scholarly literature has increasingly identified themes such as marketing innovation and organisational innovation: "*An innovation is the implementation of a new or significantly improved product (goods or services), or process, a new marketing method, or a new organizational method in business practices, workplace organisation or external relations"* (OECD, 2005). While earlier attempts at defining the concept of innovation were almost exclusively limited to the invention and the technical implementation of a product and the improvement of the production process, this new definition is applicable to more than just technologies.

Product innovation is the implementation of a new or significantly improved product or service. **Process innovation** means the implementation of a new or significantly improved production or delivery method, and involves new ideas of a technological nature. **Marketing innovation** is the development of new marketing methods with improvement in product design or packaging, product promotion or pricing. **Organisational innovation** involves the implementation of new organisational methods in business practices, work organisation or external relations.

Why is non-technological innovation important? The creation of a new product always involves large amounts of resources: qualified and creative manpower as well as a broadly understood research and an R&D infrastructure. The steps taken are becoming more and more deliberate since it cannot be left to blind chance what the outcome of our innovations will be. Thus, nowadays the concept of innovation almost always means conscious innovation. Decisions need to be made about the investment of resources – but what is an *intellectual product* worth before it becomes material goods or an implemented service, or a process that facilitates the creation of both? What is an intellectual product worth when only its creators and some scientific researchers or development engineers understand its significance or operation? There is great level of risk linked to *an innovation since it has no financial value up to the moment when it reaches the stage of being introduced to the market.* Technological advances in the economy represent no value by themselves since it is the customer who passes the final verdict on their actual financial value. For example, the benefits of groundbreaking solutions cannot be demonstrated in carefully written analyses and studies since what is needed is for the new solution to be tested on the market. Naturally, *an innovation can only be regarded as successful if its outcome will bring financial advantage to its owners and users in the market place.* The manufacturing of a product might be made cheaper (by improving the process) and a new product or service might be successfully launched on the market; however, these same objectives are pursued by a lot of competitors. What can be seen is that some products will be sought after while others will remain almost unnoticed; this is when the importance of marketing innovation comes into focus.

Let us imagine that two companies launch their functionally identical products on the market at exactly the same time. Market demand is created through a marketing activity for a product that previously seemed to have weak sales potential. Carefully conducted market research can result in more successful product design as well as more efficient and complex advertising. The company that implements this can realise greater sales or build a more prestigious brand name. In this way the same product can be sold at a higher price in relation to the production cost; thus, the rate of profit is higher than in the case of the rival company that launched the same product but used no marketing activity. Moreover, marketing enables a more accurate identification of the product's target group and customer base, which can then be reached much more easily when subsequent innovations are made. In other words, the significance *of innovation in the sales area has increased.* Infocommunication tools and media convergence play a prominent role in this change: due to the exponential growth and increasing accessibility of advertising, entertainment and other similar contents, it is becoming increasingly difficult to attract the attention of individuals, companies and public institutions (as consumers). *It is no longer enough to manufacture a good product since it must be marketed fast and efficiently.*

The significance of organisational innovation is easy to understand: for example, manufacturing processes can be made cheaper if the number of employees is smaller, or if the work is carried out more efficiently. If the labour force is recruited more effectively, it might result in enhanced productivity. If a stimulating environment is created in the workplace, the information flow between colleagues will speed up, which can result in more new ideas and faster problem solving. If the individual (even informal) knowledge of all the members of an organisation is arranged into a clear portfolio, the right person for the right job is easier to find.

Innovation and adaptation

Scholarly literature focuses on the concept of innovation whenever the theme of producing new information and knowledge is discussed. In the past it was the sphere of science that was regarded as being the driver of economic and societal transformation. However, abstract knowledge does not have a direct impact on everyday life and does not necessarily result in economic competitiveness. A good example is the Soviet Union, which had a technological and scientific performance of a world standard but at the same time poor economic performance, leading to the subsequent collapse of the country's entire economy. Today innovation is often understood as the later stages of creating and marketing a new product, service or process, primarily linked to companies. This is also reflected by the standpoint of the experts commissioned by the OECD: *"Innovation is the transformation of an idea into a new or improved product launched onto the market, or into a new or developed method used in the industry and commerce, or a new approach taken to some social service"* (OECD, 1994: 19).

In this approach innovation does not include the concept of research and development[1] which provides users with explicit knowledge prior to innovation and which is systematic knowledge that generates further knowledge. "***Research and Development*** *(R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge of man, culture and society and the use of this stock of knowledge to devise new applications. R&D is a term covering three activities: basic research, applied research and experimental development."* (OECD, 1994: 29).

If the definition of innovation given by OECD is interpreted with the intention of generalisation, it can be said that innovation comes into being as a result of R+D and/or the flow of technology. According to Kirkland, ***technology transfer*** *is the process during which ideas and techniques generated in one area are applied in another area.* As has already been mentioned, scientific achievements as well as realisations and inventions created with non-scientific methods are only as valuable as they are applicable. This means that an intellectual product must be described and presented in a way that people apart from the inventor would also be able to understand the exact operation and all essential features of the material prod-

[1] There is another trend as well, according to which the concept of innovation does not only include research and development but all planned (and at times accidental or ad hoc) renewal and adaptation processes and phenomena. In the information society the system of institutions, culture and individuals must be ready to learn.

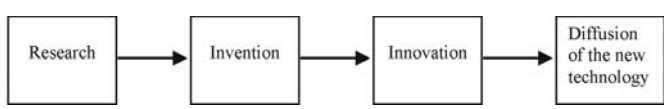
uct, service or process that can be created from this intellectual product and thus they would be able to compare it with similar products, services and processes they are familiar with; i.e. scientific knowledge must be converted into technological knowledge in order to ensure its marketability. *Technological knowledge makes recognisable and applicable packages of various techniques that are designed to accomplish certain objectives.*

Scientific and engineering knowledge are equally important in the framework of producing and exploiting new technologies. In areas where such skills are available, there is a natural tendency to obtain or reconstruct knowledge that was created elsewhere. The ability to adapt and apply existing knowledge is of paramount importance and is hard to differentiate it from the process of producing new knowledge and technologies: *in fact, adaptation is the recreation of an innovation performance. Those actors that are the first in applying new information and knowledge have the greatest advantage.* However, application requires an adequate legal and institutional background, a qualified workforce, the ability of various actors to co-operate, as well as financial capital that can be accessed fast and flexibly. These factors will be discussed in detail at a later stage.

VARIOUS INNOVATION CHAIN MODELS

At first innovation was modelled as a linear process: it was considered to be a sequential activity. The starting point in this model was the new achievement of *basic science,* which researchers then have to convert into applied scientific results. These results no longer represent abstract knowledge but mark the framework in which scientific knowledge is worthwhile and applicable. From this point onwards the results of *applied science* serve as a basis for developing new products, services and processes. These early development phases can be carried out equally by a company or a scientific research team. However, the next phases are dominated by profit-oriented companies, since the new product needs to be adapted to market conditions: the target group for the given product, service or process needs to be exactly defined; and decisions need to be made about the design that most suitably matches the company's image and the product's functionality. The costs of manufacturing the product and of positioning it in market must be calculated, as well as the expected business outcome.

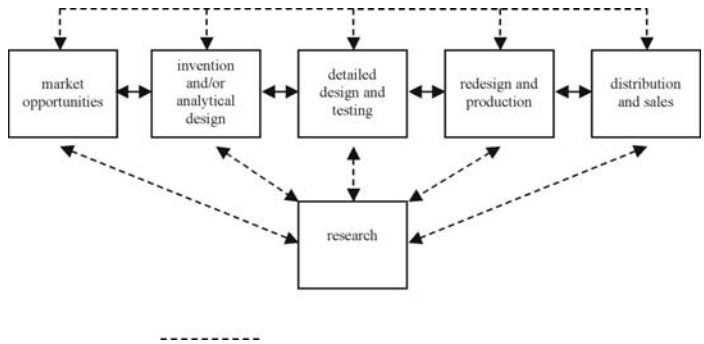
1. Figure. Linear model of the innovation process



Source: Borsi, 2004: 9

This linear model of innovation resembles technical processes and ignores a lot of important factors. In the linear model, diffusion, or spreading, begins with the purchase, copying, parallel discovery, etc. of a technology or product, in other words, with its marketisation. In the same model a technology shift occurs when a marketised and more or less diffused innovation is no longer needed, i.e. a substitute innovation starts spreading.

2. Figure. The link-chain model of innovation diffusion (knowledge flow)



Source: Borsi, 2004: 10

The concept of the link-chain model was created by Kline and Rosenberg (Kline–Rosenberg, 1986). *In the link-chain model, businesses recognise product ideas as a result of market- and/or other factors and they test elaborated product designs based on these ideas; the approved product version is then launched onto the market after several steps of correction.* Accordingly, this is not a one-way process since *in order to overcome the difficulties that arise during the development process it is often necessary to return to the previous phases.* There is a constant feedback between different parts of the process. The success of the innovation in this case depends on how efficiently companies are able to establish and maintain the interaction between the phases of the innovation process. It is important to point out that according to the link-chain model, the market virtually forces innovation out, i.e. the market is not "pulled" by the impetus of the scientific-technological development.

If we examine innovation from the perspective of businesses, it becomes clear that *innovation appears as an investment issue at each point of a company's activity: it acts in the hope of achieving success on the market and this remains its main point of orientation during the decision-making process*. Technological breakthrough most often occurs outside of companies, which means that *the primary task of companies is to recognise those scientific and engineering results which they can convert into market success in time and at a reasonable cost. In this case innovation is a conscious striving determined by the identification of market needs and by companies' strategic plans.*

In contrast with the linear model of the innovation process, *the link-chain model and even the closed* innovation chain model call attention to the importance of ensuring interaction and flow between each of the phases in order for the innovation to retain its dynamics. In a large number of cases scientific research is not needed for the development of a new product or process. Technologies required for the creation of a product, service or process can also be purchased. A product technology is converted into successful sales by one company but not another. It is possible that only the marketing strategy needs to be changed in order to achieve success, but perhaps larger amounts of capital are required to successfully exploit a given technology than are available to the company that owns and applies the given technology. Furthermore, it may be the case that changes in work practices during the manufacturing process will eventually result in a reduction of the product's price and a previously un-

successful innovation will become successful on the market. This means that one innovation can be made economically successful by another innovation. What is more, the success of innovation activity can be affected by events that fall outside the scope of science. For example, a market liberalisation process, i.e. the legislative activity of the state aimed at doing away with and preventing market monopolies will make smaller actors interested in pursuing innovation activities and will thus facilitate the market success of new, innovative products and services.

To sum up, innovation is a complex and complicated process, involving among other things *the multiple interactions between available research results, market opportunities, abilities and strategies.* The various elements of the innovation process do not follow each other in a linear succession but, depending on the nature of a given innovation, may run parallel with each other and in some cases not all the elements participate in the innovation process.

1. The relationship between infocommunication technologies and scientific research

The use of *infocommunication technologies* has exerted a significant influence on innovation processes and on the underlying scientific research; however, this impact cannot be expressed in numbers exactly. The immense capacity for calculation introduced by the computer brought about new results in some areas of basic science. For example, the most recent results in astronomy, in aviation research and in molecular biology would be hard to imagine without the existence of informatics. There are no longer any areas that are unaffected at least to some degree by informatics. The coupling of informatics with other disciplines has led to the emergence of new interdisciplinary, transdisciplinary or multidisciplinary sciences (e.g. bioinformatics). In addition, ICT has played an indisputable role in the invigoration of relationships in international science since even research teams that are physically far away from each other are now able to co-operate with each other on a daily basis.

1. Table. Sectoral breakdown of the R+D expenditure in the biggest companies in and outside Europe

	The 500 biggest companies in the EU		The 500 biggest companies outside the EU	
	R+D investment in the given sector expressed as a percentage of the R+D investment in all the sectors	R+D expenditure as a percentage of income from sales	R+D investment in the given sector expressed as a percentage of the R+D investment in all the sectors	R+D expenditure as a percentage of income from sales
Automobile and automobile parts	23.8	4.6	15.7	4.1
Pharmaceuticals and biotechnology	17.0	15.2	18.5	15.1
IT hardware	12.4	15.6	22.9	8.6

	The 500 biggest companies in the EU		The 500 biggest companies outside the EU	
	R+D investment in the given sector expressed as a percentage of the R+D investment in all the sectors	R+D expenditure as a percentage of income from sales	R+D investment in the given sector expressed as a percentage of the R+D investment in all the sectors	R+D expenditure as a percentage of income from sales
Electronics and electronic equipment	10.3	6.5	10.9	5.7
Chemical industry	7.2	4.2	4.2	3.8
Space technology and defence industry	6.8	8.0	2.1	2.7
Engineering industry	4.6	2.5	2.5	2.8
Telecommunication services	2.8	1.0	2.0	2.5
Software and computer services	2.6	12.8	7.8	10.0
Oil- and gas industry	1.9	0.3	1.2	0.5
All the other 21 sectors together	10.6	1.5	12.2	2.1
All the 31 sectors	100.0	3.2	100.0	4.5

Source: European Commission, 2007: 6

The leading areas of science that experience groundbreaking progress in a given period clearly induce the intense competition of technological development. The most innovative industrial and service sectors have the closest links with those areas of science in which the use of ICT generated a sudden leap in development: out of the 500 biggest companies of the world it is the companies active in the area of services based on pharmaceutics, biotechnology, IT hardware, software and computer services that are forced to invest the most in R+D in order to maintain and improve their market position. These companies typically spend over 10% of their income from sales on research and development.

2. The relationship between infocommunication technology and innovation

The most significant national commissions for scientific research and development throughout the modern era were given primarily at times of preparing for war. Governments were behind infrastructural developments since through these they could maintain a certain control over the population. Mass education was thus a tool in creating people with predictable and controllable personalities.[2] *Institutions of higher education and academies in Europe*

[2] Of course, at times the incumbent political leadership used it to facilitate the process of democratisation.

were indeed centres of knowledge; however, they rarely formed ties of co-operation with businesses during the emergence and the flourishing of the capitalist economy (in the 18th–19th century). They were places of learning available for the key players of the new socio-economic order (as individuals) but they were independent and separate entities and had ties only with the state, which acted as a patron or commissioner of research. Businesses at the time were often established based on an inventor's[3] idea or managed to flourish by benefiting from the individual performance of some creative engineers. The improvement in transport and transportation infrastructure and the increasingly globalised competition provided the opportunity for the advantages gained in technologies to be exploited by business.

In countries with adequate capital concentration, the protection of intellectual property rights and a less regulated market attitude were ensured and the relationship between "knowledge producers" and "knowledge appliers" was stimulated, resulting in a competitive advantage that is perceptible even today. However, *research work conducted on commission directly by the state and directly or indirectly serving the purposes of the army were characteristic of this period.* Even companies that carried out scientific research and development activity received commissions mostly from the military: the robust development of some business giants in the heavy machinery and chemical industries *around the turn of the 19th century* was partly due to this fact. The resulting technological achievements only appeared in the form of civil applications with significant, decade-long delays. It can therefore be stated that *the scientific sphere, which is the classical social sub-system of research and development, impacted economic competitiveness only indirectly.*

In Europe, attempts at creating directly applicable knowledge were made to the detriment of the autonomy of universities and academies. In France, for example, Napoleon established colleges to train engineers, and Germany used the same "detour" in order to secure the human knowledge resource that were at the same time practical and built on a scientific foundation. Thus, the complex system of colleges, universities and academies that came into being in Europe did not prove to be as efficient as the institutions of higher education in the United States, where universities were more readily able to respond to the demands of business for organisational and cultural reasons and to access external funds through this channel in addition to state support and commissions for scientific research. Taking advantage of the performance of a highly developed defence industry, the American system exerted a positive influence on economic competitiveness. It is likely that as relationships between universities and businesses expanded, researchers working on military development projects occasionally converted their knowledge to support activities in the non-military business sector.

The gradual development of the money market during the 20th century and primarily after WW II created a new situation. As a general rule, those investing capital want a guarantee that those who use the financial resources placed at their disposal are able to do so successfully, and the best guarantee for this is the creation of an innovative product or service that can be sold on the market or the development of an improvement to a process (production technology) that radically increases their turnover or profits. *In response to this, a new type of enterprise emerged in the developed countries, namely the so-called "spin-offs", which are a common form of technology-intensive start-ups and built on results achieved mostly by*

[3] The inventor often did not have formal higher education; a good example for this is the extremely productive inventor, Thomas Alva Edison.

university researchers and which can be exploited by business. Similarly to technology-intensive start-ups in general, the main asset of these small businesses is the innovativeness they demonstrate in product and service development, although they need access to capital investment (so called *"venture capital"* on terms more favourable than traditional credit, as well as experience in corporate management and especially in marketing in order to optimally exploit their potential.

All these key factors and the emergence of the digital world mutually influence each other. *In short, ICT use impacts innovation directly or indirectly in the following ways:*

- entirely new scientific performance is achieved through the expansion of computing capacity and informatics in general;
- the enrichment of scientific discourse and better availability of information enhances the creation and availability of new knowledge and thus activities related to its application and exploitation;
- ICT use facilitates technology transfer;
- work organization in companies and communication with business partners are made more transparent and rational; complex corporate management systems emerge; performance monitoring, quality assurance and other management solutions are easier to control;
- the new generation of machines stimulated the technology race; robotics appeared in industrial manufacturing and from now on the most important "labour" is the programmed machine which needs to be constantly improved;
- innovation cycles become shorter, while the technology shift becomes faster;
- the development of a global, "real time" money market facilitates the transfer of technologies and broadens the field for venture capital; at the same time, the money market has become very sensitive to technological competitiveness;
- ICT enables and necessitates the fostering of dynamic relationships between key actors (research institutes, companies, local- and central government).

THE ROLE OF R+D AND ICT IN ECONOMIC COMPETITIVENESS

Whether we examine the relationship between productivity and R+D or that between productivity and ICT we are facing a difficult situation. In theory the correlation seems clear. On the one hand, it can be said that if the performance of scientific R+D engineers is of a high standard, it leads to new technologies, and new technologies enhance productivity. On the other hand, the use of infocommunication technologies facilitates the better organisation of work and the better management of business relationships; moreover, ICT is used in new generation machines and thereby contributes to increased productivity. However, when examining what indicators should be used to measure the above three factors, the relations between them are more than hard to argue.

Productivity is measured as the output per work hour or worker, or per unit of invested capital. Output is basically defined as the gross value of market sales. However, the closed innovation chain model reveals that market success is more closely related to the recognition of a scientific-technological breakthrough and the ability to apply it practically than to the scientific performance of the country where the user of a technology operates. In the next

section of this chapter it will be demonstrated *that a company may outsource research and development activity to R+D institutions based in economically less developed countries.* The fact that R+D performance is primarily measured by the resources invested in it causes an additional problem when examining the relationship between R+D and productivity.[4] Experience shows that developed countries have spent large amounts on research and development for a longer time and in the majority of cases it is the companies that contribute the greater proportion of research and development expenditure. *On the whole, the correlation between research and development and productivity is significant but is increasingly regarded as being indirect.*

It was Manuel Castells who examined the relationship between the appearance and application of ICT technologies and productivity (Castells, 1996), and his discoveries are still valid today. During his investigation he faced the following problem: when productivity was measured with what we can now call a more traditional method, it showed that between the 1970s and the 1990s the rate of increase in productivity halted at the centre of economic-technological development, despite the fact that the use of ICT became more intense during this time. The total productivity index measured in countries with the strongest economies was also stagnating (United States, Canada) or showed an increase of only 1-2%. Japan was the only one during this period where the pace of growth did not increase but it did not decrease either (1.3-1.4%). Furthermore, hardly any advancement was detectable in the service sector (where ICT can be most directly utilised). One of the reasons for this might be that there was a delay in the increase of economic productivity in relation to the appearance of technological innovations. This is well demonstrated by the fact that the highest productivity growth rates (2-9% annually) were measured in the most competitive economies between 1950 and 1973, when the technological innovations made during World War II primarily restructured industrial production, most certainly played an important part.

In his work *The Rise of the Network Society* Castells arrived at a clear conclusion: *"In order for technological discoveries to permeate the entire economy and thus enhance the growth of productivity in a perceptible way, all factors of the production process, the culture and institutions of society and, naturally, economic enterprise must undergo significant changes. This general statement is especially valid in the case of the technological revolution, which is centred around knowledge and information and which is embodied in symbol processing manipulations that are perforce connected to the culture of society as well as the level of education and professional qualifications of the population."*.

Castells and other leading economists also faced the dilemma that the methods of measurement they applied did not adequately map the structural changes in the information society, since in an indirect way they did not take account of information processing operations. If the service sector is examined industry by industry, significant productivity growth can be seen in those cases where the impact of ICT on performance is theoretically expected to occur the soonest: telecommunication, rail and air transport and transportation showed an annual rate of 4.5-6.8% productivity growth in the United States between 1970 and 1983.

The relationships between productivity and ICT and between productivity and R+D reveal that the closed innovation chain model can be regarded as a valid description. At the

[4] Because of the difficulty in determining the value of an intellectual product, which we mentioned earlier on.

same time, it can also be seen that significant success can be achieved by using starkly different strategies at the level of companies and of national economies alike. W*hat appears to be a shared characteristic between successful practices is* that they all involve varied and dynamic relationships. *In these practices flexible and robust networks are established with different actors* (research and development bases, governments, small- and medium-size businesses, innovative start-ups, private investors) *in order to facilitate the diversity of business activities* (supply chain management, organisational information and knowledge management, production technology development, market sales, etc.). Some of the connections are vertical, in which case the profile of the network is determined by a powerful company and the other actors function as its suppliers. Today there are, however, an increasing number of networks built on horizontal connections, especially in Europe. In these networks the more or less permanent members are almost equally powerful and typically operate in the same industry. Horizontal connections are mostly locally embedded and are suitable for achieving significant cost savings (by joint acquisition of raw materials and joint product delivery and sales). Joint innovations of strategic importance are less widespread; however, large-scale actors – mostly big corporations acting upon government initiatives – show an increased willingness to participate in such ventures.

1. Division of labour in R+D across the globe

Since the early 1980s companies have increasingly adopted the practice of outsourcing some of their operations in collaborative projects worldwide – a number of research and development projects are also outsourced (design, technological development, research, testing). This involves not only commissioning other local actors (such as institutions of higher education) and utilising infocommunication technologies to facilitate the outsourcing of certain R+D tasks to centres that are far from the company's headquarters. The reason for this is that even the *biggest multinationals do not always have the necessary professional R+D capacity; innovations of strategic importance are better facilitated if development networks are established.* Research and development costs are constantly increasing and this has created the need for co-operation across national boundaries.[5]

Development networks can be horizontal or vertical. In the first case, companies active in the same market, who are thus actually rivals, co-operate with each other and with R+D centres, since it is in their interest, at least temporarily, to work together in order to achieve a technological breakthrough. In such instances the technologies involved are at a so-called pre-competitive stage, i.e. none of the participant companies manage to create a marketable product or service with their technologies.[6] In vertical development networks suppliers and

[5] Of course through its subsidiary a multinational company is present in the country where it outsources its R+D activity. This helps with co-ordination and grants easier access to state allowances companies are entitled to if they carry out innovation in the given country.

[6] For example, a company may want to develop the data transfer technology of mobile phone networks in order to be able to provide more complex and more marketable services, or to make wireless data transfer secure. Such development projects may boost the entire sector, enhancing the marketability of mobile telephones and the services they provide many times over.

buyers are in co-operation with a company. An example for such co-operation is the development of the Boeing 777, where Boeing involved the big airlines in their development work. Representatives of British Airways, All Nippon Airways, Japan Airlines and United Airlines were present from the beginning of the design process to the end of manufacturing. Development ideas created by the airlines helped the manufacturer to develop one of the most marketable aircraft in the world.

Some development networks actually *include both horizontal and vertical elements.* A good example for this is the development of the European Airbus in which a great many European aircraft manufacturers and research institutions worked in co-operation. A perfect example for how outsourcing works is that in the case both of the Boeing 777 and the Airbus R+D, major development tasks were carried out by the development engineers of the Russian Sukhoi, Ilyushin and Tupolev companies. *As a result of co-operation the production development cycle is shorter, parallel efforts are reduced and no surplus information is accumulated. Vertical and horizontal co-operation is facilitated by infocommunication technologies: thanks to the software used in design (computer-aided design (CAD) systems) the partners in co-operation are able to maintain a common development environment without being limited by geographical boundaries. This can be viewed even by (potential) buyers and each stage of the process can be accurately monitored by the project's participants. Moreover, ICT enables companies to receive up-to-date information about customers' tastes and product-related problems.*

Companies have begun to think "without borders" more and more when it comes to making decisions about the geographical locations of their research and development activities and they have stopped insisting on these activities being carried out in their respective home countries. Despite occasional failures, *"research and development is realised in the framework of international co-operation, the necessary capacities for which are gathered from various parts of the world with costs and commercial risks shared between countries and regions and adaptation to specific local conditions dealt with in local organisations"* (Bőgel, 2006: 81).

2. Intellectual property rights: help or hindrance to innovation?

Although the subject of this chapter does not directly involve the issues of *intellectual property rights,* their impact on innovation should be briefly touched upon. Throughout history the special practice – originating from Europe – of ensuring legal protection for intellectual products has stimulated innovation. It was in 1474 in the Republic of Venice that the first *patent law* was adopted, and this practise was followed in England in 1624. *The legal protection of an intellectual product*[7] *which was deemed original or a novelty meant prestige for the lawful owner of the intellectual product and made it possible for inventors, innovators and scientists to form a fair relationship with those interested in the business utilisation of such intellectual products.* Thus, creative men (at least in theory) could not be stripped of the

[7] Its most frequent forms in different legal environments include patents, protected brand names and copyright on design.

financial gain from their valuable performance and were thus encouraged to come up with new inventions and their registration even if they personally did not have the opportunity to convert their intellectual product into a marketable products. The door was open for them to sell their knowledge to wealthier people.[8]

Before the adoption of patent laws Europe (and later North America) the only way for creative professionals to achieve success was by participating in government development projects. Naturally, *innovation has always played a part in achieving market success, and at times in winning social respect; however, until recently it was all done solely by the manufacturer craftsman.* European universities, which were considered to be capitals of knowledge, did not have any definite or directly stimulating effect on economic development. In contrast, a lot of artisans at the time introduced innovations for their own benefit.[9] In this way technological development in Europe maintained a relatively unbroken path throughout various historical periods. In contrast, societal relations solidified, starting from the late phase of antiquity, when the flow of knowledge and the turnover of goods subsided and opportunities of free people to exercise their rights were weakened.

Intellectual property rights can provide efficient protection for products that can be fully described with all their particular details recordable in a design and in text. The decision-makers in the competent patent office must be able to understand the essence of the intellectual product and they must be able to compare it with other similar intellectual products. This requirement has *had a stimulating influence on the development of highly standardised engineering designs and terminology.* Countless inventions and innovations have been recorded and systematic techniques developed to document the emergence of technologies. Engineering professions and engineering sciences were developed. This has laid the foundation for the conversion of intangible information and knowledge into material products.

It has been pointed out already that the use of infocommunication technologies is especially significant since it facilitates the flow of knowledge formulated in the language of technologies. Technology transfer generates significant business volume: the buying of licenses that enables the use and further development of technologies can amount to as much as 5–10% of total sales, dependent on the industry.

There are numerous theoretical debates and conflicts in connection with the various forms of intellectual property rights. The information society, the acceleration *of the information flow and better access to information causes tension in two opposing ways. On the one hand, the conversion of information and knowledge into products should be appreciated*

[8] In the modern world the role of the customer has been taken over by organisations with legal personalities; however, in the 17th–18th centuries we can only talk about merchant-tradesmen.

[9] For that matter merchants adopted the Arabic numeric system, developed the system of double-entry book-keeping and the most varied forms of business practices. In addition, being the owners of monopolies they created the foundation for the logistical systems of provisions for armies, which was a powerful innovation. It was not only the state but also shareholding companies specialising in oversees commerce that amply awarded mapmakers and expert shipbuilders for their fast improving engineering activities. In England the sudden boom in the development of mining in the 18th century was the result of the gradual expansion in investment opportunities and creative engineering developments occurring simultaneously.

since through this the real owners of knowledge and the most competent users of data and information can gain financial profit, which is a characteristic feature of a kind of meritocracy. On the other hand, however, *this all happens in a lopsided way in practice since the work of innovative creators may well bring privileges for those who secure strict legal protection for it, which means that in effect those in possession of mobilisable financial capital can build monopolies, using the protection of intellectual property rights as a cover.*

THE SIGNIFICANCE OF GEOGRAPHICAL SPACE TODAY: CENTRES AND PERIPHERIES IN THE ECONOMY OF THE INFORMATION SOCIETY

As the degree of complexity of products and services rises the competitiveness of a country or a company is fundamentally dependent on how fast and to what extent it is able to acquire new information and new knowledge as well as on how fast it is able to convert this knowledge into marketable products and services. One possible way of acquiring knowledge, information and technologies is "home production"; however, this way cannot be followed on its own due to the specific features of technological innovation (capital intensity, the role of "chance events", the influence exerted by other industries, etc.).

The age of globalisation has brought with it a proliferation of knowledge and technological innovation of unprecedented proportions. In addition to companies' internal research bases, the role played by technology transfer has become more prominent. It can be seen in the closed innovation chain model that openness to innovation is necessary at each phase of business activities. If, for example, the core business of a company is to develop the latest generation of hardware, it is not worth investing in separate R+D teams to develop logistical functions (harmonisation of transportation, warehousing and sales). Competences required to realise these tasks are better purchased. One way to do this is to buy the needed technology ready-made, together with the necessary equipment and training necessary for optimal utilisation. Another possible way – if a customised solution or one that a company wishes to sell on is sought – is to commission a specialist external R+D company.

The optimal way in which a company can achieve a required innovation is determined by the company's management style, the given industry's sectoral structure and the scale of resources (human, financial, technological) that can be mobilised to realise the innovation. An organisation can always enhance its capacity to innovate by using additional R+D capacity, i.e. by co-operation. There is mounting pressure from company managers, who want to see R+D departments making a more direct contribution to business success and for this to be realised not only in the long term. In fact, recognising market demands and technological trends may result in "small innovations" that will be realised in the form of short-term market sales and therefore have a fast turnover rate. Only time will tell what negative effects – if any – the ever-shortening temporal horizons have on the long-term R+D and business competitiveness of companies (see Gupta–Wilemon, 1996). A greater contribution of R+D to business success can only be realised through the greater integration of business and technological strategic planning processes. The role of research directors must also change in such a way that they should not only be in charge of implementing their department's contribution to corporate strategy but also participate in the creation of that strategy.

Speed of development is one of the most important factors of competitiveness. Reducing the time required for developing a new product can primarily be achieved by establishing cross-functional teams[10]*, the use of CAD systems and the method of concurrent engineering, where product development runs in parallel with production development and the creation of the marketing strategy.* This development method could be especially important in those industries where a reduction in the development period plays a decisive role in gaining an advantage on the market. Speed enjoys a high priority primarily in the case of Japanese companies. According to some surveys, Japanese managers are willing to devote twice as much time to speeding up the development process than their American counterparts. Companies that can produce high quality products within a shorter time than their competitors will have more room for manoeuvre. For example, if they start the development at the same time as their competitors, they will be able to launch the ready product onto the market much sooner. Alternatively faster companies also have the opportunity to delay the start of the project in order to get more insight into the development of a given market and its consumers. Being faster, they can still launch their product at the same time as their competitors and have it far better adjusted to consumer needs. Another advantage of speed is that they can offer a greater variety to customers and thus better cater to the different demands of various customer segments.

The systems that have been created as a result of the fast development of infocommunication technologies enable companies to enjoy the benefits of decentralisation and centralisation at the same time. For example, integrated information systems between decentralised organisational units make it possible for companies to continue their centralised purchases, i.e. to harmonise their purchases more efficiently than before (e.g. greater quantities can be purchased at a discount price). The creative use of ICT also allows for the parallel operation of decentralisation and integration. One of the basic conditions of both external and internal integration is the possession of useful and accurate information: an organisation (or co-operating organisations) must have relevant data about its (their) own internal state at every single moment. Modern data processing systems (EDI, MRP, the already-mentioned CAD/CAM systems)[11] as well as integrated management information systems are becoming increasingly widely used.

All the foregoing should show that *business actors must be innovative both in the area of developing new technologies and in their company operations:* the latter can bring significant short-term benefits; however, the former is essential in order to achieve long-term success. *At the same time, the successful development of a new technology is greatly dependent on the company's operation.* For example, only those companies that can provide very detailed documentation on their previous business activities are likely to be granted venture capital. Small companies usually have no capacity to do this and a newly established company will not focus on this either. Thus, the most advantageous credit option requires a sophisticated corporate culture as well as innovativity.

[10] Permanent or ad hoc teams of employees each having competences in a various department (marketing, development engineer, legal expert, etc.).

[11] EDI (Electric Data Interchange)
MRP (Material Requirements Planning)

There are such differences (qualitative as well as in magnitude) between market actors that small, (uniquely) innovative companies often accept buyout offers proposed to them by globally embedded, bigger actors. Thus, the bigger company can enlarge and upgrade its product range, while the smaller one is able to radically improve its sales abilities and production capacities. *Buyouts, as a form of technology transfer and a method of innovation accumulation is a characteristic approach taken by multinationals towards actors on the economic periphery.* The question arises as to whether the diverse forms of technology transfer will reduce or increase differences in regard to the development of the global economy.

It can be seen that the information society, the wired society at large and the world economy stimulate innovation and make it into a means of economic survival. Creative minds may increasingly have access to the best scientific results in every area of knowledge and be able to envisage peak technological performances. Thus equipped, if they can come up with the inventions, their knowledge provides them with an opportunity from which they and indirectly their environment can benefit, even if they lack experience in business, in the legal protection of intellectual property and in financial capital. What we have here therefore is a tendency for narrowing gaps in regard to the wealth-production abilities of different countries; however, an elite group of multinationals (production and service-providing companies and financial investment companies alike) is becoming increasingly stronger.

In practice, the significance of spatial location is not reduced, since it is clearly seen that successful innovation requires bringing together more and more components: *adequate legal protection (i.e. the legal regulatory environment); "accessible venture capital", a developed financial system and general business culture; "world standard R+D location"; various forms of government support (e.g. fiscal incentives, partially underwriting venture capital investment, etc).* Included with these must be the concentration of resources which are necessary for the achievement of technological breakthroughs, as well as immense speed in producing "small innovations".

According to Virilio, *"Society was based on brakes all the way up to the nineteenth century, and there were hardly any tools to increase speed"* (Virilio, 1998: 42). Positions and privileges were maintained by putting into operation various brakes, such as castle walls, laws of prohibition and those securing privileges, and economic monopolies. Virilio claims that the industrial revolution was also the revolution of transportation, whether one looks at the railway, steam ships or the telegraph. When these inventions appeared it became increasingly more difficult to rein back the evolution of a global economic competition, although this was also the time when protectionist economic policy had its heyday. The flow of intellectual products, economic raw materials, half-ready and ready products grew and this process culminated in the application of infocommunication technologies. The speed of turnover reached such a level there was no way for the brakes to be put on. *"Economy is the hidden side of speed and speed is the hidden side of the economy. The two form an inseparable unit."* (Virilio, 1998: 30). By now the expression "you are wealthy" has become synonymous with "you are fast".

It can be argued that, *given a suitable ICT background, daily co-operation is possible even at a global level.* Why can the importance of the location not be ignored then? *Various kinds of actors must find one another and trust is a key element in this.* The actors cannot

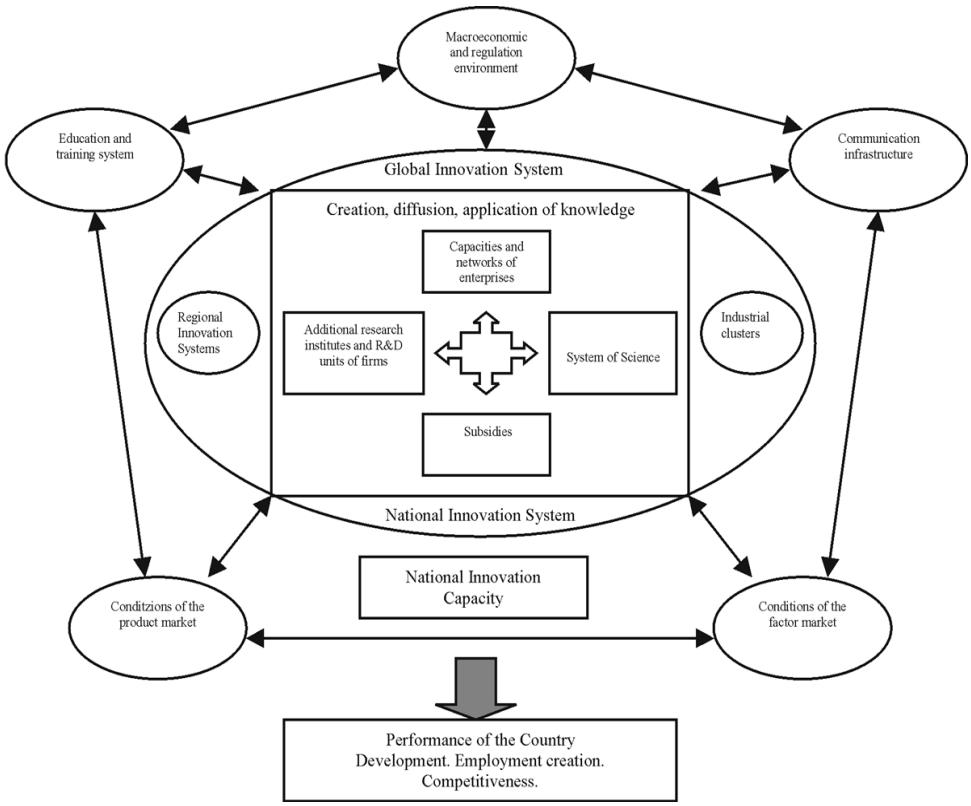
judge one another's performance in a reliable way since a company manager and a scientific researcher, a development engineer, a lawyer, even a politician (who tries to interfere with the intention of introducing restrictions or giving incentives) all see the world from different angles. Mutual trust is facilitated by a shared understanding of the rules of the game (and the same legal regulation), the face-to-face handling of any disputes that arise, and visible, joint achievements. An established city in an already rich country can be regarded as a joint achievement, since *necessary competences are concentrated in big cities, as well as trust amongst the actors that have these competences.* These locations have an extremely strong appeal to capital investors, creative minds and company managers: *they become the centres of interest; things that happen there are interpreted as trends, and are adopted and adapted to by others.*

When the speed of the information flow was solely dependent on experts who mediated knowledge, there were a number of places that served as mediators between the most peripheral and the most central areas. This "semi-periphery" seems to be disappearing now and the central position is no longer held by nations but more and more by the big cities and their hinterland (New York, London, Tokyo, Singapore). *In countries where size imposes a limitation on the development and long-term operation of such centres, or where the location was originally on the periphery, great industrial-technological specialisation* (see Finland), *a vast concentration of resources* (see China) *must be coupled with a high degree of trust* (see Scandinavia) *or highly efficient centralised organisational performances* (see the Far East) *in order for robust and competitive networks to be formed by different types of actors. The concentration of resources can result in less innovation-intensive economic successes* (see India, the Far East). *Thus, every part of the world (country or region) must find its own potential breakout point along the trend-line of the developing world economy and its technologies, or risk the gradual diminution of its economic significance.*

1. National and regional innovation systems

While the role of strategic planning is increasing, the opportunity for specifically state-level intervention is continuously decreasing. Academic literature on innovation uses the concepts of **National** and **Regional Innovation Systems** (NIR and RIR) to call attention to the obligations and opportunities relating to intervention in locations which are legally, economically or perhaps culturally defined. According to Freeman, the *National Innovation System "is the network of institutions in the state- and private sectors the activities and interactions of which initiate, import, modify and disseminate new technologies"* (OECD, 1997: 10).

"The main objective of NIR analyses is to assess and compare the channels of knowledge flow as well as to identify bottle-necks. In this way economic policy can intervene where necessary and ensure the uninterrupted flow of knowledge. In a simplified way, we can say that it is the role of relationships between the industry, R+D and the government in scientific and technological development that is under examination" (Borsi, 2004: 12).



3. Figure. Relations in national innovation systems

Source: OECD, 1998: 62.

It can be clearly seen in figure 3. that the innovativity of a country or region is a combination of processes involving numerous factors. It needs to be emphasised that when it comes to innovation no single factor is unrelated to any other. The system-based NIR or RIR approach is capable of dealing with numerous potential linking points that were previously described by the closed chain model of innovation processes. This approach is especially important in that it facilitates the finding and linking of creative, non-integrated innovation centres. In this way the work done by original knowledge producers has a better chance of yielding economic benefits.

SUMMARY

The need for renewal is a fundamental one in the information society, since in the era of globally accessible information, real-time communication and money circulation the competitive arena has expanded. Today, even small-scale, local activities are impacted by factors and actors that used to be unknown or distant. One of the most globalised social spheres

is the economy, thus it is no coincidence that the need for renewal, in the guise of "innovation", was most intensely studied in economic science. The capacity for innovation has been specially emphasised in relation to the competitiveness of companies.

The most tangible manifestation of market success is the successful and large-scale sale of a radically new product. For this reason, innovation was primarily understood for a long time as the path leading to an entirely new product or service, or a revolutionary change in the production-manufacturing process. Nowadays it would be impossible to have such breakthroughs without a scientific foundation; therefore, the analysts of innovation first approached this theme through a linear innovation chain model. The basic premise for this model is that the new research results of scientific workshops generate technological breakthroughs because companies who are familiar with these scientific results strive to find a way to apply the newly found information and knowledge and try to convert them into a series of marketable products or services. Those who are successful in this transformation are the most competitive and most successful companies.

However, this approach has changed with time. Analysts recognised that companies basically work to find cost effective solutions to their everyday problems. In order to achieve this they may implement several tiny modifications in their organisational-logistical and production processes as well as in their product transformation and marketing activities. In themselves these may not necessarily require significant research and development work or creativity but have a very significant cumulative effect in regard to competition in market sales. In the information society, research and development, i.e. the "production" of new knowledge, can provide tangible "raw material" that can potentially be used by thousands of actors. That is why genuinely creative research and development workshops do not necessarily have to be at the centres of economic life; they can be based in more remote and less dynamically developing countries without having to redraw the map of economic power relations.

It can be concluded from the above that in the information society, research and development, which for a long time has been regarded as the key to innovation and economic competitiveness, has an indirect impact on the competitiveness of given regions and countries. In practice, the importance of spatial location has not decreased but it has been placed in a new light. Provided that the key actors (companies, government, the scientific sphere, higher education and the non-profit sector) can trust each other enough and are willing to collaborate, success can be guaranteed by bringing together accessible venture capital, the sophisticated financial system and business culture, world standard R+D sites and various types of state support. All these factors together result in the concentration of resources required for real technological breakthroughs as well as providing the dynamism necessary for "small innovations". However, if a given facility is not available (at a reasonable price, quality or speed) in one's immediate environment, it may be possible to recruit competent partners from among the actors of more remote locations, thanks to the new level of information management. Thus, every part of the world (country or region) must find its own potential breakout point along the trend-line of the developing world economy and its technologies, or risk the gradual diminution of its economic significance. The approach in which the most important actors and processes are seen as a National Innovation System provides a solution to this situation.

REVISION QUESTIONS

1. Explain the principles of the chain-link and closed innovation chain models.
2. What are the similarities and differences between adaptation and innovation in a company's life?
3. When is a company forced to implement more technological development: if the scientific disciplines facilitating technological development are going through significant changes or if they are stagnating? Explain.
4. What forms of innovative enterprise were fostered by the expansion of the international capital market after World War II?
5. List at least six consequences that resulted from the use of ICT on innovation activities directly or indirectly.
6. What are the shared characteristics of successful countries and regions in regard to their network of relations (relations between companies, and relations between companies and other actors)?
7. For what reason would a company start a joint technological development with another company?

BIBLIOGRAPHY

1. Key bibliography

OECD & Eurostat (2005): *The Measurement of Scientific and Technological Activities. Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data* (OECD Publishing, Paris)

OECD (1997): *National Innovation System* (http://www.oecd.org/dataoecd/35/56/2101733.pdf, accessed 12 July 2007)

2. Optional bibliography

Journal of Product Innovation Management

ÉVA SIMON

Introduction to the legal regulation of information society

REGULATION IN THE INFORMATION SOCIETY

This chapter deals with the theoretical and practical issues of the information society's legal regulation, with special regard to the Internet. Our textbook will reach readers in several member states of the European Union, so we shall refrain from discussing law at the national level. Our aim is for the readers to understand the principles of legal development of the European Union and the global regulatory policy defining the regulatory framework, and for them to be able to develop their own view of the various issues.

1. What does legal regulation of information society mean?

In a broader sense, legal regulation of information society, also known as **information society law** means all those regulated interactions that may arise in an information society. If we accept that our current society is an information society, then we could say that all laws, judicial decisions, **self-regulation** and social norms are part of the legal material of the information society, which might in effect embrace the complete legal system.

However, we use the expression information society law in a narrower sense, referring to the rules regulating the social relations and technological capabilities now founded on modern communications networks. Within information society law, the reader often comes across the expression *Internet law* as a special area. This is deceptive, however, for it implies that there is regulation which differs from other legal relations, and only encompasses the rules regulating the Internet. It is better to talk about information society law, a sub-area of which is the regulation of legal transactions on the Internet.

Information society law encompasses, among others, questions of accessibility, intellectual property rights, personal data protection, freedom of speech, electronic commerce, press law, certain types of computer crime, electronic signature, as well as questions concerning the jurisdiction of international law. *While criminal law, constitutional law or civil law are sub-areas with unique regulatory arrangements and principles, the rights of the information society are horizontally interwoven through the vertical legal system.*

When we talk about the system of norms and rules regulating the information society, we cannot disregard the fact that our society is rapidly changing. The objective of the rule of law and legal systems is stability, consequently, they are only able to regulate, with due circum-

spection, actual circumstances that occur en masse. Accordingly, there are two possible methods of regulation: legislators either try to regulate in advance the expected life conditions, through **ex-ante** regulation, or wait for the processes to develop and regulate afterwards, which is called **ex-post** regulation.

In the case of legal relations within the information society, *ex ante* regulation is only possible in a very limited sphere, due to the rapid change of technical solutions. *Ex ante* regulation creates a clear and transparent situation, but can easily become an obstacle in the way of development, since it tries to regulate unknown situations with regulatory devices. In the case of *ex post* regulation, legislators react to real demands. As long as the market regulates itself properly, the legislator does not intervene. Ideally, even at the moment of intervention, the legislator intervenes only to the extent which is absolutely necessary. Beside the rules created and sanctioned by the legislative bodies, the self-regulation of market participants is also significant. By **self-regulation**, we mean the independent systems of rules of the various sectors of business life, like the chambers of trade and industry with regard to the legislative instruments. The system of rules created by the market participants can adapt more flexibly to the rapid changes of the information society. These self-regulating mechanisms can serve as an indication for the legislator. Wherever the market is able to regulate itself, there is no need for state intervention. A good example of this is the distribution of *domain* names[1]. Due to the global nature of the network, the tasks connected to the distribution and maintenance of domain names must be regulated on an international level. Self-regulation was responsible for this task from the start.[2] The Directives of the European Union and other documents underline the importance of self-regulation.[3]

2. The need for regulation

As the information society gained ground, social structures underwent a transformation as well:[4] the Internet transformed the dimensions of communication, of business and the functioning of the state. In the 1980's the Internet was used mainly in the academic sphere, and

[1] The *domain* name is a technical identification made up of alphanumerical characters, which is used in Internet communication instead of the essential IP-addresses, primarily because it is easier to remember.

[2] In certain countries (e.g. Finland and Spain) the delegation of the ccTLD country code is performed by state-level organisations.

[3] Certain sub-areas of electronic commerce and content regulation are typical examples.

[4] In their work entitled *Law and the Internet: A Framework for Electronic Commerce,* Terrett and Monaghan compare the legal relations of the Internet to the development of 17th century English commercial law. In the 17th century, a whole series of laws and legal cases ensured the rules of legal relations regarding commerce. However, with the discovery of new continents and the development of new forms of commerce, new institutions and banks were created. Both the volume of commerce and the speed of transactions increased. Consequently, the shortcomings of the regulation system became evident. Legislators had to find answers to the old and the new social conditions, either by insisting on the application of accepted rules, which would have meant decreasing the importance of the new conditions, or by changing the regulation and introducing a system of norms appropriate to the new life situations. Compared to the changes in 17th century England, the difference is that it is not certain countries, but all countries that have to face new challenges concerning the Internet.

use of the network required quite a lot of technical knowledge. The great breakthrough came with the *World Wide Web* in 1992.[5] Use of the network became easily accessible to everyone and soon enough, commercial and administrative contents appeared, and at the same time, the need to regulate the Internet emerged in the world of business and in the mind of the regulator.

The response to the need for regulation was to raise two concerns. The first question was: is it necessary, or indeed possible to regulate the Internet? The second was: if intervention with regulatory means is possible and necessary, in what form should it be implemented?

The main arguments around the possibility of regulation centred on how to ensure controllability in the case of a decentralized network over which no single state has exclusive jurisdiction? At first, it was impossible to tell which of the theories concerning Internet regulation would finally win. The way we think of the Internet is constantly changing, as is discussion about it. New theories emerge all the time, arguments are settled, and others take their place. Kuhn's conception regarding the paradigm change of scientific theories may be applied to this process; namely that several theories simultaneously compete with one another until one of them wins. When one of the new theories is accepted as normative by those working in that field of science, we talk about a change of paradigm.[6] The rival theories regarding the regulation of information society can be divided into three groups (Kuhn, 1996).

The myth of the legal vacuum

According to the myth of the legal vacuum[7], the fact that no single state has *exclusive* jurisdiction over the Internet means that *no state* has jurisdiction over the Internet at all. This point of view is held not only by those who are not familiar with technology and the Internet, but also by the community of Internet users. The myth of the legal vacuum rejected state intervention and regarded the Internet as a space where only the users could determine the system of regulation, and where no state could reach it.[8] Adherents of this regulatory view argue

[5] *The World Wide Web* differs from the Internet in that the Internet is the network of networks, connecting millions of computers and making communication between them possible, while the *web* interconnects hypertext documents via the Internet. Thus, the *World Wide Web* is a system of information distribution based on the Internet.

[6] Such was the "Copernican turn" or the theory of relativity. During the period of rivalry prior to the change of paradigm, the disputing partners do not share common ground; a certain communication disorder develops between them, which can be remedied, although with difficulty. Followers of the competing paradigms regard different phenomena as similar, and categorise them differently.

[7] This theory was decisive in the 1990s.

[8] John Perry Barlow formulated the Declaration of the Independence of Cyberspace in 1996. The declaration states: "We have no elected government, nor are we likely to have one... I declare the global social space we are building to be naturally independent of the tyrannies you seek to impose on us. You have no moral right to rule us nor do you possess any methods of enforcement we have true reason to fear... Governments derive their just powers from the consent of the governed. You have neither solicited nor received ours... Cyberspace does not lie within your borders.".

that the only way of regulating the Internet is to follow "netiquette", the ethical norm system developed by the users themselves, and no state or international organisation may regulate the space developed by the users.

Special regulatory space

The theories of the second group regard the Internet as a special kind of regulatory object. Those that promote these theories argue for the development of a regulatory system which addresses the questions of freedom of speech, anonymity and electronic commerce as an issue of Internet law. The wish to create the Internet's own laws can be traced back to the myth of the legal vacuum. This theory considers the Internet as a sovereign state that exists on the networks, irrespective of the physical place of the computers and users. The need for the creation of Internet law gained ground when problems of law enforcement arose.

Integrated regulation

The third group consists of representatives of the victorious paradigm, who did not try to separate the legal relations of the Internet from the existing social structures, but considered them as an integral part of the latter. It is here that the theories regarding the regulation of the net – resolved by a minor or major adaptation of the existing legal system – can be grouped.

When an ample number of problematic real life circumstances had developed on the internet, it became clear that the internet cannot be excluded from the existing criminal law and civil law legal relations. Today it has become evident that the Internet is not so very different from our existing world. People buy books on the Internet, advertisers advertise and users have conversations or simply read newspapers, hence many laws created decades ago can also be applied to the Internet.

3. Recommendations for regulation

Regulation of the Internet is different in each country, because of local political, social and cultural attitudes and because legislators transpose into the world of the Internet legal terminology and basic values created prior to its appearance.

Advancing this argument, David Johnson and David Post, in their article *Law and Borders: The Rise of Law in Cyberspace* (Johnson–Post, 1996), suggest a solution through the self-regulation of Internet users, in preference to adopting the legal systems of particular countries. According to their argument the Internet should be regarded as a sovereign state where user names and e-mail addresses create life, instead of the reality of physical life.

Logically, the suggestions that urge the creation of a common, supranational regulatory authority can be traced back to this theory. In his book entitled *The Law of Cyber-Space*

(Kamal, 2005) Ahmad Kamal argues that global dialogues should be initiated in the interest of comprehensive and concerted legal regulation. The solution according to Kamal, is the creation of international agreements, based on the consolidation of different legal systems and accepted by everyone. Kamal compares the legal regulation of the Internet to the problems faced in dealing with the high seas, where the absence of international legislation created a vacuum. The international community finally started negotiations on the Law of the Sea and did finally succeed.

"The challenge is far greater. The speed of change is phenomenal, the dangers affect all countries without exception, new shoals and icebergs appear every day, and global responses are sporadic or non-existent. There can be no doubt whatsoever that a globally negotiated and comprehensive Law of Cyber-Space is essential."[9] Kamal argues that this can only be realized efficiently by a supranational organisation.

The authors who tried to create Internet regulation by opposing the myth of legal vacuum primarily stressed the counter-arguments. According to Christopher Reed, all the operators of internet legal relations (the user, the internet service provider, the content service provider, etc.) exist in the real world and fall within some kind of jurisdiction: The network and the computers exist physically, consequently, they also fall within some kind of jurisdiction. "In reality, the Internet is not deregulated, it is one of the most regulated spaces of the world, and due to the fact that it can be reached from anywhere, it is actually covered by all jurisdictions." (Reed, 2000).

Among those arguing for integrated regulation, Lawrence Lessig distinguishes four regulatory solutions: *i)* Legal regulation, which means, by analogy, the appropriate application of earlier regulatory systems. This includes laws, and in common law, case law as well. *ii)* The second type is regulation through the system architecture. This means the rules emerging through hardware and software technology, i.e. through standards and protocols defined in the course of developing the architecture of the Internet, and enabling operation. These are, among others, the application of IP addresses, with which every user becomes easily identifiable. Thus, regulation of architecture creates system operational conditions irrespective of legal regulation. *iii)* The third type consists of those social norms which similarly to other social interactions regulate the operation of the Internet. (Some typical norm systems that have developed in the course of social coexistence: we say hello when we meet someone, during an argument we listen to the other party, etc.). *iv)* The fourth type of regulation is the regulating mechanism of the market. The laws of supply and demand in the Internet marketplace are partly similar to those of other markets, while new market behaviours have also been introduced (Lessig, 1999). The significance of Lessig's theory lies in that he did not aim to create a new regulation system, instead he systematized and ordered the operational mechanism of the Internet into a new system.

[9] If we examine this argument properly, we can establish that the Internet appears as a source of danger, and this is what lies behind Kamal's need for regulation.

[10] Every computer that connects to the Internet receives an IP-address. Computers use this formula in the course of communicating with each other. There cannot be two identical IP-addresses on the network: this guarantees that any two distant computers can contact each other. This also means that anyone can immediately be identified in the course of Internet transactions.

4. The object of regulation

Social scientific literature normally distinguishes between four theories explaining the reasons for state intervention into market processes by regulation:

- *Failing market:* when the market is unable to change certain structural problems (lack of competition, monopolies, asymmetrical legal relationships: typically in the field of consumer protection, etc.).
- *Public interest:* when the state intervenes to protect the public interest.
- *Individual interest:* when the aim of regulation is for the state to regulate market conditions in the interest of certain participants (for example by preventing competitors from entering the market).
- *Life cycle:* during the initial phase regulation serves the public interest, which later becomes the individual interest of certain market participants. It is in order to restore these structural shifts of interest that intervention takes place again and again.

Solutions for internet regulation can be divided into two broad groups: one of them is the group of rules regulating internet access and primarily concerning infrastructure; the other is the regulatory system concerning questions of content appearing on the internet. The first group includes communications rules, technical questions regarding access, and the **complete or partial restriction (internet filtering**) of Internet access, which may occur for political or other reasons.[11] The regulatory system belonging to the second group can be divided into several fields. The limits of this chapter do not permit us to deal with all the regulatory forms pertaining to the Internet; therefore, we shall deal only with the legal system belonging to the second group, and only with certain sub-areas of it. We shall focus on the content regulation and information rights.

Regarding questions of content regulation it is important to note that the laws regulating internet activities, the self-regulating mechanisms of the market, and social norms are not necessarily special, or rather, they are novelties in certain respects only. Imagine that if a libellous statement about someone appears in the printed press or on television, the aggrieved party may successfully demand compensation. If the same thing appears on the Internet, then the rules of libel, as are the rules of compensation are applicable. The problem is it was published in another country, or the given homepage can be found on a server in a different country. If we take it into consideration, we can affirm that the situation is similar even if the infringement was committed in a paper published in another country or on a television programme broadcast from another country.

The main problem in connection with the internet is not that completely new rules have to be created but rather how the legal authority should be determined, and how the rules can be

[11] Up to the end of the 1980s, communications services were provided by the government or the public sphere everywhere except in the United States. The result of privatisation starting in the 1980s (in the 1990s in the post-communist countries) was that the communications systems, which were no longer owned by the state, deemed the creation of some kind of legislation necessary, so as to be able to ensure proper service. With the end of monopolies, regulation continued to develop and extend to issues of competition law and consumer protection.

enforced. The existing legal regulation regarding international commerce, taxation, copyright issues, contracting and penal offences are similar in democratic nations and are defined in international agreements.

5. Questions of jurisdiction

The notion of national sovereignty formed the basis of the creation and adoption of legal systems. One of the controversial issues in connection with the regulation of the Internet is to what extent we need to abandon the notion of national sovereignty with the disappearance of borders.

One of the most famous examples was the *Yahoo!* case. On the homepage of the American-based Yahoo!, users were uploading Nazi memorabilia for auction, and because of this two French organisations (LICRA and UEJF) filed a suit against them in 2000, saying that the distribution of Nazi relics put up for sale on the *Yahoo!* auctions was a violation of French law. In its judgement the French Supreme Court declared that *Yahoo!* was to develop a filtering system which excluded French internet users from auctions of Nazi relics, failing which it would have to pay one hundred thousand Francs a day in fines. Although *Yahoo!* changed its auctioneering practice, it refused to acknowledge the judgement and asked the Court of California to establish that a judgement made in France is not enforceable for an American-based company. In 2001, the American court declared that *Yahoo!* was not obliged to observe the French judgement regarding restriction of content: American laws apply to websites that are operated from America, and according to the First Amendment[12] to the American Constitution, the owner has a right to freedom of speech, and judgements of foreign courts cannot be executed. The American Court of Appeal reached the same decision in 2005. Naturally, the judgement applies only to the American Yahoo!, its French subsidiary is obliged to comply with French laws and the judgement of the French court.[13]

REGULATORY FIELDS RELATING TO INFORMATION SOCIETY

As we have already said, the legal material concerning information society is interwoven into our legal system horizontally. The rules related to information society are enshrined to a greater or lesser extent in the several areas of law. We cannot discuss all the regulatory issues of information society but the reader can review the list of recommended scientific literature for further reading in order to gain in-depth knowledge of the various areas of law.[14] As in any regulatory domain, the legal content concerning information society can be grouped ac-

[12] Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances (1791).

[13] The judgement exemplifies that in the event of a debate, national courts strive for the acknowledgement of their own jurisdiction.

[14] See list of recommended readings.

cording to the system of law.[15] There are two distinct groups: the laws organising legal relations between the state and its citizens, and between the various state or public organisations (called public law), and the laws organising legal relations between citizens and partnerships, and between members of civil society (civil law). Differentiation is based on the relationship between those involved. While in the first case we can speak of an unequal legal relation based on subordination and superiority, in civil law the typical legal relation is one of equality and coordination.

In the continental legal system, we can distinguish between four main categories: (i) civil law, (ii) criminal law (iii) administrative law, and (iv) constitutional law.

(i) Civil law regulates the property personal and family relations of natural and legal persons in cases where the partners are equal and state intervention, except for legislation, occurs only in the event of a legal dispute. The most important areas affecting information society are as follows:

- e-commerce,[16]
- digital signature,[17]
- content regulation,[18]
- protection of copyright and industrial property rights,[19]

[15] In this chapter we specifically deal with the regulatory instruments created by legislative bodies, we shall refrain from introducing the rules of technology, the market and society. Beside each topic we shall also enumerate the relevant directives of the European Union.

[16] Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce).

[17] Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures.

[18] Decision No 456/2005/EC of the European Parliament and of the Council of 9 March 2005 establishing a multiannual Community programme to make digital content in Europe more accessible, usable and exploitable (Text with EEA relevance).

[19] Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, Council Directive 91/250/EEC of 14 May 1991 on the legal protection of computer programs, Council Directive 92/100/EEC of 19 November 1992 on rental rights and lending rights and on certain rights related to copyright in the field of intellectual property, Council Directive 93/83/EEC of 27 September 1993 on the coordination of certain rules concerning copyright and rights related to copyright applicable to satellite broadcasting and cable retransmission, Council Directive 93/98/EEC of 29 October 1993 harmonizing the terms of protection of copyright and certain related rights, Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases, Corrigendum to Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonisation of certain aspects of copyright and related rights in the information society (OJ L 167 of 22.6.2001), Directive 2001/84/EC of the European Parliament and of the Council of 27 September 2001 on the resale right for the benefit of the author of an original work of art, Directive 2004/48/EC of the European Parliament and of the Council of 29 April 2004 on the enforcement of intellectual property rights (Text with EEA relevance).

- media law,[20]
- competition law.[21]

(ii) *Criminal law* regulates acts that are a danger to society. We can group all those acts committed with22 or against IT technology which are dangerous for society and for which the law orders the sanction of punishment. Legal regulation of information society is primarily concerned with the following categories of crime:[23]

- misuse of personal data,[24]
- content-related crimes (e.g. distribution of child pornography, hate speech, etc.),[25]
- crimes against computer systems and data,[26]
- infringement of copyright.[27]

(iii) *Administrative law* is the regulatory system of state functions. State administration extends beyond central government and local government to larger systems; for example the

[20] Council Directive 89/552/EEC of 3 October 1989 on the coordination of certain provisions laid down by Law, Regulation or Administrative Action in Member States concerning the pursuit of television broadcasting activities, Directive 97/36/EC of the European Parliament and of the Council of 30 June 1997 amending Council Directive 89/552/EEC on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities.

[21] Commission Directive 2002/77/EC of 16 September 2002 on competition in the markets for electronic communications networks and services (Text with EEA relevance).

[22] Of course, not every crime committed with a computer can be listed as being specifically part of information society 's area of law, for if this were the case, grievous bodily harm caused by a computer would, ad absurdum, belong here.

[23] Council Framework Decision 2005/222/JHA of 24 February 2005 on attacks against information systems.

[24] Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data, Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

[25] Amended proposal for a Directive of the European Parliament and of the Council amending Council Directive 89/552/EEC on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities ("Audiovisual media services without frontiers"), Opinion of the European Economic and Social Committee on the 'Proposal for a Decision of the European Parliament and of the Council on establishing a multiannual Community programme on promoting safer use of the internet and new online technologies'(COM(2004) 91 final — 2004/0023 (COD)), Council Decision of 29 May 2000 to combat child pornography on the Internet.

[26] Convention of the Council of Europe concerning cyber crime, COM(2000) 890 Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee of the Regions Creating a Safer Information Society by Improving the Security of Information Infrastructures and Combating Computer-related Crime.

[27] See remarks on copyright.

operation of transport, security, military and information systems. The following functions essential to information society belong to this group:

- electronic administration,[28]
- electronic register of companies,[29]
- administrative procedure,
- electronic public procurement.[30]

(iv) The fourth field is *constitutional law,* which arose out of continental legal development. The object of regulation is to the structure relations between the citizens and the state and the organisational structure of the state. The constitution is the document describing basic rights, responsibilities and procedures thus creating the basis for the process governing political, economic and social life. Areas of constitutional law related to the information society are as follows:

- electronic freedom of information,[31]
- personal data protection,[32]
- freedom of the press and freedom of expression.[33]

[28] Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – i2010 eGovernment Action Plan – Accelerating eGovernment in Europe for the Benefit of All {SEC(2006) 511}.

[29] Directive 2003/58/EC of the European Parliament and of the Council of 15 July 2003 amending Council Directive 68/151/EEC, as regards disclosure requirements in respect of certain types of companies.

[30] Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions – Action plan for the implementation of the legal framework for electronic public procurement {SEC(2004)1639}/* COM/2004/0841 final */, Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors, Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts.

[31] Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information.

[32] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data. Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications), Implementing rules relating to Regulation (EC) No 45/2001 of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data — Bureau decision of 22 June 2005.

[33] Council Directive 89/552/EEC of 3 October 1989 on the coordination of certain provisions laid down by Law, Regulation or Administrative Action in Member States concerning the pursuit of television broadcasting activities, Directive 97/36/EC of the European Parliament and of the Council of 30 June 1997 amending Council Directive 89/552/EEC on the coordination of certain provisions laid down by law, regulation or administrative action in Member States concerning the pursuit of television broadcasting activities.

INTRODUCTION TO SOME SPECIAL LEGAL AREAS

The next part of this chapter will present three areas of regulation, the aim of which is to describe three fundamentally different models. Since the regulation of the audiovisual media concerns the content-related issues of regulation, it serves as an accurate illustration showing the significance of self regulation and co-regulation that exist in addition to state regulation. Within information rights personal data protection in the EU is regulated in detail and the most important rules of regulation with regard to accessing public data are applied at national level.

1. Regulation of audiovisual media services

In the discussion of regulations with regard to the content-related issues of the information society it is important to keep in mind that it is not only communication via the Internet that forms part of the subject but also television and radio. Technological innovations and converging platforms are making it clear that regulation should be introduced independent of the various platforms: *services provided by interacti*ve television, *IP TV* and even *YouTube* and *Joost* represent frontiers where the various regulatory models run into one another. Audiovisual policy is linked to several other EU legislative areas such as competition law, telecommunication law, as well as the regulation of e-commerce and consumer protection.

The regulation of television and that of the Internet were implemented along different principles. The scarcity of resources is one of the fundamental reasons why the state can interfere in the freedom of the media. While a newspaper and a homepage can be launched relatively easily and with a smaller investment, the availability of frequencies determines the number of television channels and radio stations that can be launched. However, the digital changeover and the appearance of new platforms will significantly alleviate the shortage of resources. Therefore, the level of regulation in the case of Internet content provision is lower than that of television broadcasting.

The European Commission's audiovisual policies include issues pertaining to television programmes, films and *online* content provision but do not cover radio broadcasting and the printed media.

A whole range of documents, some obligatory and some discretionary, have been issued in the EU with regard to digital media. The Commission's communication COM (1999) 657 entitled *Principles and Guidelines for the Community's Audiovisual Policy in the Digital Age* lays down six basic principles of regulation: the principle of proportionality, separation of transport and content regulation, the protection of general interest, recognition of the role of public service broadcasting and the need for transparency in its financing, self-regulation and the activities of independent authorities.

The two most important documents, forming the backbone of media regulation and within that the regulation of television broadcasting are the European Convention on Transfrontier Television and the proposed Audiovisual Media Services Directive amending the Television without Frontiers Directive and expected to take effect at the end of 2007. Within the requirements with regard to the content and structure of programmes this Directive will address the quota system of European works, the broadcasting of highlighted

events, the principle of the country of origin, the protection of minors and the prohibition of hate speech as well as advertising regulation.

The reality of converging services and platforms have led EU legislators onto a new path of regulation. The review of the Directive is expected to have a significant impact on *online* media, too. The basis of the new regulatory framework is that the EU will create a common "minimum regulation" with regard to **linear** and **on-demand services** (non-linear services), while stricter rules will continue to be applied in the case of linear services.

Regulation at the Directive level only sets up the regulatory framework which is then to be filled with content by each member state obliged to formulate concrete media market regulations. At the same time, the Directive and the non-obligatory EU documents also attribute great significance to the self-regulation of market players as well as the co-regulation of the authorities and the market.

The European Commission emphasises that the regulation to be carried out should be decided upon only after a careful analysis: "in particular whether legislation is preferable for the relevant sector and problem, or whether alternatives such as co-regulation or self regulation should be considered. […] Member States should, in accordance with their different legal traditions, recognise the role which effective self-regulation can play as a complement to the legislation and judicial and/or administrative mechanisms in place and its useful contribution to the achievement of the objectives of this Directive.".[34]

Flexible co-regulatory and self regulatory mechanisms may play an important role in the regulatory framework in line with the various legal, cultural and social traditions of the member states; therefore, several references are made to their significance in the audiovisual media regulation directive.

2. Information rights

Information rights include both personal data protection, also known as the protection of privacy,[35] and ensuring access to public data, also known as freedom of information. The protection of privacy and freedom of information represent the two sides of the same law: while the protection of personal rights ensures the inviolability of citizens by the state, freedom of information ensures the transparency of the state for the citizens. This section will first look at personal data protection and then freedom of information and within that the freedom of electronic information.

Personal data protection

Personal data protection in the information society poses new problems for those dealing with legislation and jurisdiction alike. The scope of personal data increased due to the operational features of the network, and the *number of controllers* has also risen to a significant degree; furthermore, new ways of data collection and storage have emerged.

[34] COM(2007) 170 final.

[35] The protection of the private sphere means the protection of *privacy* in the Anglo-Saxon legal systems and the protection of personal data in the continental systems of law.

The increasing *scope of personal data* results from the special features of network operation; ID numbers and various traffic data related to communication, e-mail addresses, IP addresses, and user names, might constitute personal data. The increase in the number of *controllers* is due to the network operation: the access, Internet and content providers all process personal data.

Regulation with regard to personal data protection in the area of telecommunication and the information society began in the EU at the end of the 1990s.[36] The foundation of EU regulation on personal data protection is provided by "Directive 95/46 EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data". This Directive established the minimum standards of personal data protection within the EU, this being higher than that in the United States[37] and most of the non-EU countries. However, this prescribed minimum level of security does not limit member states' freedom to adopt stricter regulations than those laid down in the directive.

The Directive includes the most important definitions relating to personal data protection, regulations relating to automated technical data processing and data quality, principles requiring authority to give information to the data subject, the data subject's right to object and principles relating to the transfer of data to foreign countries.

According to the regulations of the Directive, data may be transmitted to areas outside the European Union only when the level of protection in that country reaches the EU level or if the data subject has given their explicit consent. The purpose of this provision is to ensure hat the personal data of EU citizens will not be abused abroad.

As regards the information society, work on sectoral data protection regulations started at the end of the 1990s. "Directive 97/66/EC of the European Parliament and of the Council of 15 of December 1997 concerning the processing of personal data and the protection of privacy in the telecommunications sector" is of outstanding significance. This Directive is to be applied in the area of services related to the information society. The Directive concerning data protection and electronic communications was adopted as a sectoral regulation in 2002.[38]

The European legislation has seen progress in recent years. In accordance with the fight against terrorism and to ensure national security, elements pertaining to security policy entered legislation, opening up the previously closed data protection system and thus creating the opportunity for the wide range storing, preserving, and transferring personal data in the investigation of serious criminal acts.[39]

[36] Prior to this, in 1980, the OECD *(Organization for Economic Cooperation and Development)* Guidelines on the Protection of Privacy and Transborder Flows of Personal Data were adopted, see http://www.oecd.org/document/18/0,2340,en_2649_34255_1815186_1_1_1_1,00.html

[37] In the United States there is no normative data protection system at the federal level that establishes data protection guarantees in the business sector like the ones in the EU.

[38] Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data in the electronic communications sector (Directive on privacy and electronic communications).

[39] Directive 2006/24/EC of the European Parliament and of the Council amended Directive 2002/58/EC on the provision of publicly available electronic communications services as well as the keeping and modifying of data produced or processed within public communications network services. The object

Freedom of information

Freedom of information ensures the transparency of the state for its citizens.[40] It provides the opportunity for citizens to access information about the activities of the state and to become familiar with data of public interest, thus ensuring the transparency of the state.[41] Regulations in regard to the freedom of information differ from that of personal data protection: there are no EU directives specifically providing for the access of public data by electronic means; however, several member states regulate this issue at national level.

International legal documents ensuring the transparency of the state after World War II defined the right to the freedom of information within the scope of the freedom of expression. The Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights and the European Convention on Human Rights all lay down the right to become familiar with and disseminate information and ideas. At the same time, some states ensured the freedom of information in their national rules of law[42]. In former socialist countries access to public data and the transparency of governments appeared in the national level legislation only after the change in their respective political systems.[43]

The information society has changed the ways in which the right to freedom of information is exercised. With the emergence of the network environment the activities of the government can become far more transparent than ever before. *It is generally true about the information society that fundamental rights can be exercised on a much wider scale than before.* This is particularly true for the freedom of information. Governmental organisations, courts and public administration can easily make the data relating to their management, activities and staff accessible on their homepages. Regulations arranged in databases can be easily searched, and communication with administrative organs can take place electronically, for example if someone needs to receive data or wishes to arrange other administrative affairs.

A series of state measures are necessary in order to ensure the protection of the electronic freedom of information. In order to ensure the freedom of information the state is obliged to

---

of the new directive is to harmonise the provisions of the member states with regard to the data retention responsibilities of the providers of publicly available electronic communications services and to the providers of public communications networks, and to ensure that communications turnover data be made available for the investigation, uncovering and prosecution of severe criminal acts as defined by the national law of member states.

[40] Freedom of information is usually not a civic liberty. Therefore, everyone can exercise it, regardless of their citizenship status.

[41] The fundamental ideas of information freedom, which ensure the transparency of the state, can be traced back to the period of the Enlightenment. It was first in Sweden that an act on the freedom of the press furnished the right for every Swedish citizen to access official documents. The Act was adopted in Sweden 1776, not long before The Declaration of the Rights of Man and of the Citizen adopted during the French Revolution, which proclaimed that "citizens are entitled to examine the necessity of all public expenses, in person or through their representatives, give their consent and check the way these expenses are used".

[42] Here are a few examples of Acts on the freedom of information adopted: Finland 1951, United States 1966, the Netherlands 1978, New Zealand 1983.

[43] Hungary 1992, Czechia 2000, Estonia 2001, Poland 2002, Slovakia 2001, Romania 2001.

work with those organisations processing administrative data and other data of public interest so that such data are reliably electronically accessible. Thus, on the one hand, the freedom of electronic information means making data accessible. This is similar to posting information relating to cases of public interest on public notice boards in the past. The advantage now is that such information can be easily accessed via the Internet by anyone regardless of their place of residence. On the other hand, it means that if anyone wants to find special types of information, they should be able to inquire about them by electronic means and require such data. Electronic freedom of information not only provides new ways of accessing public data but is also a means to speed the process of democratisation and to facilitate the exercise of individual rights. However, the right to access information is not unlimited. The state must have secrets, and how such information is temporarily classified does not damage fundamental rights since it serves the wider public interest (for example, national security, criminal prosecution, etc.). It must be noted, however, that the restriction of access to information is now exceptional: the general rule is for public data to be freely made accessible.

The first Act specifically about electronic freedom of information was adopted in 1996 in the United States *(Electronic Freedom of Information Act).* In Europe it was the Treaty of Amsterdam that first declared that everyone who has at least a place of residence in the EU has the right to access the documents published by the European Parliament, the Council and the Commission provided that certain requirements are met.[44]

Directive 2003/98/EC on the re-use of public sector information is closely linked to the freedom of information; however, its scope of regulation does not apply to the exercise of the freedom of information but the use of public data. Its object is to provide for the creation of EU level information products and services based on public sector documents in a unified internal market by companies operating within the EU, the development of information products and services with surplus value, as well as the restriction of distorting competition. There are no EU rules regarding access to public data and state guarantees; these are provided for by regulations at national level.

SUMMARY

The system of rules that regulate the information society is comprised of international documents, EU Directives, national rules of law and the self-regulation of market players as well as co-regulation. The rules regulating the information society horizontally permeate the vertically established legal system. The local regulations touching on the global network issues are only partly able to enforce sanctions thus, the regulation that is present at an international level is highly important whether circumstances are resolved by state level coercive regulations or by market level self-regulation.

Existing legislation applies to the information society as well as the communications network that forms its basis. Special regulation emerges in those circumstances in which hith-

[44] It must be noted that there is a fundamentally different approach taken at the various levels of regulation, depending on whether the right is exercised by a citizen, a person with permanent residence, or is a right that can be universally exercised.

erto unfamiliar legal problems appear. Among these are the issues of digital signature, electronic freedom of information and telecommunications.

The information society policy of the European Union is unified: in those issues where there is a unified comprehensive EU policy the regulation of the information society is included. As we have already seen, in many cases this is by Directives; however, the European Union draws the attention of member states to the importance of self regulation and co-regulation.

The rationale is that rapid technological change makes it is increasingly necessary to rely on rules that have been developed by the market players, since prior intervention could become a hindrance to technical and social development. This area primarily requires *ex post* regulation: state or EU regulatory instruments must only be used to intervene where there is a danger that the balance of the market could be upset. A consequence of the convergence of platforms and services, it is primarily the technologically neutral regulatory solutions that should be effective.

REVISION QUESTIONS

1. What does information society law mean?
2. What areas need to be regulated?
3. What kind of regulatory solutions can you name?
4. Are regulations necessary? If so, what solutions do you suggest and why?

BIBLIOGRAPHY

1. Key bibliography

Campbell, Dennis – Bán, Chrysta (eds.) (2005): *Legal Issues in the Global Information Society* (Oceanan Publications, New York)

Reed, Chris (ed.) (2000): *Internet Law: text and materials* (Butterworths, London)

Warner, Richard – Dinwoodie, Graeme – Krent, Harold – Stewart, Margaret (2006): *E-Commerce, The Internet and the Law, Cases and Materials* (American Casebook Series)

2. Optional bibliography

Agre, Philip E. – Rotenberg, Marc (1998): *Technology and Privacy: The New Landscape* (The MIT Press, Cambridge, Mass.)

Bellia, Patricia L. – Schiff-Berman, Paul – Post, David G. (2006): *Cyberlaw: Problems of Policy and Jurisprudence in the Information Age* (West Group, Berkeley)

Goldsmith, Jack – Wu, Tim (2006): *Who Controls the Internet? Illusions of a Borderless World* (Oxford University Press, Oxford)

Hiller, Janine – Cohen, Ronnie (2002): *Internet Law and Policy* (Prentice Hall, New Jersey)

Lemley, Mark A. – Menell, Peter S. – Merges, Robert P. – Samuelson, Pamela (2006): *Software And Internet Law* (Aspen Publishers, New York)

Lessig, Lawrence (1999): *Code and other laws of cyberspace* (Basic Books, New York)
Reich, Pauline (2005): *Global Cyberlaw: Cybercrime and Security* (Oceana Publications, New York)
Seabright, Paul – von Hagen, Jürgen (eds.) (2007): *The Economic Regulation of Broadcasting Markets: Evolving Technology and Challenges for Policy* (Cambridge University Press, Cambridge)
Smith, Graham (2001): *Internet Law and Regulation* (Sweet & Maxwell, London)
Solove, Daniel. J. – Rotenberg, Marc – Schwartz, Paul M. (2006): *Privacy, Information and Technology* (Aspen Publishers, New York)
Todd, Paul (2005): *E-Commerce Law* (Routledge-Cavendish, London)
Westin, Alan F. (1966): Science, Privacy, and Freedom: Issues and Proposals for the 1970's (in: *Columbia Law Review,* Vol. 66)

LILLA JUHÁSZ

The information strategy of the European Union

THE CONCEPT OF INFORMATION STRATEGY

In this chapter we define the concept of information strategy which is fundamental to the creation of the information society and present the strategic policy initiatives of the European Union.

It is information strategy which assigns the tasks necessary to achieve the objectives and provides the tools indispensable to accomplishing those objectives, thus playing a central role in building the desired information society. In the following discussion we shall explain what we call information strategy; what its basic components are; why it is significant that information strategy has raised the status of some previously neglected areas of information society in political life. We shall also define a 'complete information strategy' and the necessary conditions for completeness. Our analysis is mainly based on the article entitled *Development of information strategies and their characteristics. Hungary's opportunities and possibilities, especially in respect to EU integration* written by László Karvalics, and published in 1998 (Z. Karvalics, 1998).

Z. Karvalics called "**information strategy**" the new quality of political planning at various levels (national, international, regional, federal), which appeared at the beginning of the 1990s and which comprises the handling of the following three areas together:

1. The "information public utility": information infrastructure, which consists of facilities that process public information and provide services, which include computers, databases and communication networks. By utilising these everyone will be able to access their required information anywhere and at any time easily, quickly and cheaply.
2. The informatisation of society means the complete informatisation of the most important institutional structures: politics, law, healthcare, education, etc.
3. The development policies of the information industries: preferential development of some innovation and research sectors to facilitate the informatisation of the whole economy.

Information strategy is also seen as assisting possible changes to the quality of social life: this hope is expressed in the programme of the "**building of information society**". This technique of social planning formulates visions for the future, draws a comprehensive social picture, looks ahead to the long-term, and presumes a consensus regarding this question amongst the responsible political elite. It regulates the managed concentration of resources,

and it considers education the sector that will help us to attain competitive advantage; thus education is seen as a priority area to ensure economic prominence.

The design and writing of information strategies maps the network logics of the globalised world, so, in regard to building the information society, we can separate policies on each sub-system level. The European Union follows a supranational policy, while most nations have worked out their own strategies on a national level too, although these are playing an ever smaller role and in some places have ceased completely. Plans are made on a regional level, moreover the projection of "intelligent cities" might also be considered part of the group of information strategies.

A "comprehensive" information strategy can be said to exist if all of the following conditions are fulfilled:

0. (Zero or boundary condition) The decision-making politicians are committed to building an information society.
1. There is a basic, comprehensive planning document which is accepted at the highest level which involves the whole of society.
2. Effective co-ordination of the programme at governmental level.
3. An institution specialising in executing the operative tasks.
4. An organisation that serves as a basis for scientific and methodological planning, that executes and co-ordinates the basic and applied research necessary for the programme.
5. Pilot projects are studied to gain experience before the complete execution of the programme.
6. Making the whole of society familiar with the idea and accepting of the aims and objectives.

If only three or four of these conditions are met, then it can only be claimed that a "partial" strategy has come into being, and if only one or two conditions are realised then this constitutes a complete lack of an information strategy.

A comprehensive information strategy is indispensable for a country that aims to build an information society. An information strategy is much more than the total of the directives comprising single aspects of the transition to the information society: in fact, it is a basic policy document, and a general national development plan. Such a strategy deals not only with the Internet and generally with the social usage of information tools, but with the whole of the information society, focusing on competitiveness and the quality of life because the country's future and welfare depends on its execution.

THE INFORMATION POLICY OF THE EUROPEAN UNION

The roots of this information policy can be traced back through the history of the European Economic Community (EEC, in brief: the Single Market). The Council of Ministers of the Single Market accepted the first five year pilot programmes in 1978, which included the subject of the information society and they employed several research groups. The first comprehensive programme of informatics, encompassing the whole of society, started in France at the beginning of the 1980s: this was the Minitel system which connected phone subscribers to a network offering many services through several million free-stationed terminals with

screens – significantly preceding the Internet era but achieving the connection of a mass population through telecommunications technology.

After this, information strategy at European level evolved through processes within the committee system of the European Union: the research policy that placed informatics at its centre was integrated to cater for the need for further development of enterprises, and moved in the same direction to follow the interests of the markets. Consequently, information technology (IT) and later, the information and communication technologies (ICT) began to occupy a central role in development programmes in Europe from the 1980s onwards.

1. The various levels of European information policy

In the European Union, information policy – just like other policies – is made at various levels. A united Europe has formed a new, previously non-existent organizational form; the network state which tries to meet the challenges of globalisation and localisation creatively. The **network state** (Castells, 1996) is a complex system of institutions, in which the various decision-making levels – local, regional, national and supranational – are integrated. Meetings are held at various places in a given order with a special asymmetry due to the **principle of subsidiarity**, which means the decisions are made as close to the level of implementation where their effect will be felt. The network does not have a real centre, and subordination still prevails. It has connecting points with different certificates, but these depend on each other mutually, there is no part that could neglect the other, because that would jeopardize the operation of the whole system – this is the main difference between a policy network and a centralised political structure.

In the networking mode of operation – as we shall see later – information policy is multilevel. The policy objectives are set at the supranational level, but they are implemented on a lower level in achieving national information strategies, which often deconstruct them into regional and local (regional or district level) development programmes.

The following section will focus primarily on the supranational level and will not present the objectives of specific national or regional information policies in detail.

2. The European policy for the creation of information society: from the Bangemann Report to the *eEurope* programme (1993–1999)

1994: The year Europe reached the age of majority in information politics: the Bangemann Report

1994 heralded the "coming of age" for European information policy, when it was stated in official policy terms. The report entitled *Europe and the Global Information Society – Recommendations to the European Council* was prepared under the direction of the previous Vice-President of the European Commission, Martin Bangemann with the assistance of industrial experts and users representing various sectors of society. This document, known as the Bangemann Report was debated and accepted by the European Council at a conference held on Corfu in June 1994.

The report identified measures to improve the international competitiveness of European enterprises saying it was necessary for the European Council to intervene more proactively. On the one hand to accelerate the current market liberalisation process, and also to improve and standardise the present services. In addition to the need for political intervention, the report also pointed out that financing the building and operation of the information infrastructure was primarily the responsibility of the private sector. To reassure private providers, it was necessary to formulate stable legal regulatory frameworks, which should be integrated by harmonisation of the legal processes of the Member States. This was also the most important task of information policy.

The Bangemann Report concluded that the spirit of competitiveness was the most important factor complemented by a firm belief that only free but well-regulated competition based on equal opportunities would encourage the building of the information society in Europe. There was an underlying assumption in the proposals in the report that the information revolution would bring new markets and simultaneously change the logic of the operation of the economy. Although the Bangemann Report called for a "market centred revolution" – more than a decade later when the report does not have a direct effect on the main trend of the information policy of the European Union – it can be seen that we were able to talk about market centred processes in the document but not affect them in reality. The report represented a perspective that presented the information society from a narrow economic aspect. Perhaps this contributed to Bangemann's withdrawal from political life at the end of the 1990s to establish himself in the private sector, where after the creation of an economic base, information policy started to concentrate on the socio-cultural aspects of the information society.

The Action Plan: "Europe's Way to the Information Society"

After the debate on the Bangemann Report in June, the European strategy-making engine got under way and upon the request of the European Council the European Commission introduced the document "Europe's Way to the Information Society – an Action Plan" as early as July 1994. Originally the Action Plan contained tasks only for the years 1994 and 1995, but it was regularly reconsidered and it assigned tasks for the following years. In 1996 it was revalidated and became a "rolling action plan" and its effect was extended until 1998. It reached the end of its validity only with the appearance of the new *eEurope* Action Plan.

The information policy evolving in the European Union in 1994 defined the tasks relating to the information society primarily as economic, secondarily as legal-regulatory, and thirdly as promotional tasks.

New official documents and an overview of the 1994 Action Plan (1996–1997)

1996 and 1997 were devoted to quiet examination and hard-work in the area of information policy. The administration concentrated on the execution of the previously accepted Action Plan and after extending its effect, on the consolidation of the results. In the meantime more

and more new areas were thoroughly examined to see what kind of changes the information revolution might bring for them in the shorter and the medium term.

Four main information policy guidelines were defined in the overview, which are weighted equally:

1. *The development of the economic environment:* The liberalisation of telecommunications had to be finished in each part of the European Union at the very latest by 1 January 1998. This also meant that the transparency and consistency of the interconnected national regulations had to be improved in the interests of competition in the internal market. Furthermore, the rapid spread of the information infrastructure had to be assisted, especially amongst small and medium-sized enterprises.
2. *Investing in the future:* The fact that the information society is a knowledge-based society meant that the development of research in the information areas received an enhanced role in the research framework programmes.
3. *People at the centre:* When forming the services and the content, more attention had to be given to the expectations of the population and people. It was very important that the objectives of the structural funds were more closely tied to the objectives of information policy.
4. *Accepting global challenges:* consequent on increasing globalisation, comprehensive regulations are needed to cover the whole world. The information society is also a global society, which requires that in the 21st century we should endeavour to integrate the whole world and turn it into an information society.

In 1997 the European Union concentrated on assisting the convergence and the gradual moulding of the toolkit in telecommunications, the media and the entire information technology sphere with regard to both legal and economic aspects. The main task was to dissolve the barriers to a strong information infrastructure. The market procedures of convergence had already started, so the main question concerned what kind of political steps it was necessary to take. The Green Paper entitled *Convergence of the telecommunications, media and information technology* articulated proposals to exploit the advantages more thoroughly and these have generated widespread debate in society. However, the regulatory steps to form a harmonized environment took a decade of work. In the same year Padraig Flynn, the Commissioner for Employment and Social Affairs introduced the report by an expert group on the state of the information society *(Building a European Information Society for us all – Final Report of the High Level Group of Experts on the Information Society 1997).*

This document, which encapsulates in its title the principle of *information society for all* laid down in the 1999 *eEurope* programme, considered the building the information society was acceptable only if it was supported by strong measures promoting social cohesion. That was why the document tried to define the necessary measures to help realize this intention. The document contained more than 30 recommendations; it covered topics ranging from economic questions (e.g. employment, regional integration) to the social (e.g. quality of life, health) and political areas (development of democracy). This document can be considered as the forerunner of the 1999 *eEurope* programme, because it defind the wide information spectrum of the plan and its aims far surpassed the purely economic objectives of the Bangemann Report.

3. III. The information policy of Europe: *eEurope* (1999-2005)

Jumping from the era of expert reports and conferences held with the participation of politicians from 1993 to 1997, European information policy started to emphasize the interests of the wider public by the end of 1998. Beyond the catchwords, people started to get involved in the building of the information society, e.g. on the user level of information equipment. Politicians started to take the principle of "information society for all" seriously. The social implications of information policy had to be declared, which happened with the acceptance of the *eEurope* programme. The change in the approach did not take place instantly, but happened gradually and was completed with the elaboration of the *eEurope* programme.

The *eEurope* programme is an organic continuation of the development of the European information technologies of the 90s, yet it can be seen as indicative of the new era after the economy-centred period from 1993 to 1999 characterised by Bangemann. While the measures taken until 1999 in information policy had economic objectives and social objectives appeared only at a rhetorical level instead of concrete proposals, the situation from 1999 changed. Social sensitivity, which existed previously mainly on paper, began to be translated into in specific action. In order to execute action at a high level, it was necessary to have a new strategy and a new action plan.

"Socialisation" of the building of the information society – new guidelines of the *eEurope* programme (1999)

The renewed information policy of 1999 can be connected mainly to new people, who became the leaders of the political processes at that time. The strong German influence, which was felt when the aims of information politics were determined, waned. The European Parliament entrusted Mr. Romano Prodi with the presidential tasks of the European Commission in September 1999; Mr. Jose Manual Barroso replaced him in this post at the end of 2004. Changes occurred at the Directorate responsible for the information society. Erkii Liikanen, from Finland, the "laboratory" of the EU in respect to information society social development became an influential politician and took a responsible management role. The initiative "eEurope: An Information Society for All", which was launched by the European Commission in December 1999, was practically the programme of modernisation of the newly elected president of the European Commission. Its aim was to accelerate the European processes of transition to the information society and to make the results more accessible to every citizen of the European Union. *eEurope* preserved the main economic objectives of the previous era (1993–1999), while elevating assisting social development to the same level. In order to achieve these objectives, the following specific tasks were assigned:

1. Every EU citizen, every home, school, shop and office must be involved with the digital era and connected to networks.
2. A digitally educated Europe must be formed, based on an entrepreneur culture, which is able to finance and execute the new conceptions.
3. The processes must be socially open; they should strengthen consumers' trust and social cohesion. (*eEurope* Action Plan, 2000: 1).

At the turn of the 20th century to the 21st, Europe had a comparative advantage in several areas, in particular digital television and mobile telecommunications, compared to the rest of the world, but suffered a considerable lag in other areas; for example, in Internet usage. However as integration of media, telecommunications and the Internet proceeds continuously Europe has had to implement urgent plans to try to take the lead in the global competition. Europe has experienced a rapid spread of mobile telecommunications which could lead to a competitive advantage in wireless Internet. Clearly, this area of progress should be supported. Technological advantage in this area is not new.

The European Union has largely liberalised its telecommunications moving provision from public agencies to competitive private companies within a framework of legal regulation. Three industries – the supply of content (e.g. information and sporting results), research and the promotion of telecommunications development – are all supported by the European Union. Steps have been taken to bolster consumer trust, improve tax arrangements and enforce intellectual property rights.

The poorer performance of the EU in other areas of information society development might be improved by specifically targeted programmes. To achieve this we must strengthen Internet usage, support electronic technology commercially and promote the rise of information literacy and the network culture. The public sector must lead through investment in programmes and promotion of the sector. This concentration on an Internet based task system can be defended because it agrees with the European Union's wish to focus strongly on the Internet to eliminate Europe's serious lag in this technology.

There were two further areas in which an important change of priorities can be seen. These are cultural policy, which was not a problem that could be resolved by investment, and the digital environment, which did need investment since the EU lagged behinds its competitors. Although the Bangemann Report had said that the leading role in financing development here was the responsibility of the private sector, *eEurope* laid out explicit political tasks, both in the area of publicity, and in public investment. For obvious reasons, such investments could be realised quicker if they were public rather than private. These projects are mainly large-volume infrastructure developments which cannot be provided by or could with difficulty be supported by the private sphere but are nevertheless indispensable for the more effective operation of the economy. An information infrastructure that is truly available to all can be built only with the active participation and financial support of the public sector. A decision on this has already been made at the supranational level.

The *eEurope* Action Plan (2000)

The *eEurope* Action Plan was elaborated by the European Commission, then it was submitted for debate at the European Council's meeting in June 2000 and was finally accepted by the Council. From the acceptance of the eEurope programme in December 1999 until submitting the proposal, there was a wide public debate about the objectives and the different schedule of implementation. There was an unofficial Ministerial conference in April 2000 in Lisbon on the information society and knowledge-based society, in which the members of the European Parliament and heads of states expressed their views on the *eEurope* programme. Expert opinion was available throughout the preparation of the Action Plan. Fi-

nally those writers who prepared the Action Plan restructured the main activity lines to clarify them and make them more publicly accessible. They assembled the modified activity lines into three main clusters. The new information policy was guided by the following three objectives:

1. Building of the infrastructural support that ensures access to the Internet everywhere cheap, quickly and safe Internet-usage.
2. Coaching people to prepare them for the challenges of the information society.
3. Development of the Internet-usage areas.

2002 was the final deadline for achieving the Action Plan and for all of the targets to have been achieved. In 2000 it seemed that if Europe could not fall into line then achieving the ambitious targets set in Lisbon for Europe to become the world's leading information and knowledge- society, would remain a far off goal. It is important to remember that this Action Plan was prepared before the so-called 'dotcom' crisis occurred and the American economy subsequently started to slow down. Since then the balance has changed and European development has not had to continue at such a high pace, because its main competitor's economic growth slowed down. However, the Action Plan only spelled out responsibilities and the Union did not give any financial support to the Member States for their implementation, so achievement mainly depended on national policy. "The *eEurope* targets can only be achieved if Member States, the European Parliament and the European Commission are ready to commit themselves to this Action Plan and to the reassessment of priorities which it will imply. No party can afford to relax; no matter how advanced they may be relative to others. Each Member State must be ready to set new priorities, to provide adequate funding and to remove obstacles to achieve targets." (eEurope Action Plan, 2000: 5). Therefore the success of the *eEurope* Plan depended on the Member States and the cooperation between them, as well as on the institutions of the European Union.

eEurope+ 2003: extending the targets of eEurope to the Accession Countries (2001)

The *eEurope* programme also sought to draw the new Accession States into the execution of the targets for developing the information society. In order to do this, the information strategy of the European Union called *eEurope+ (eEurope+ 2003: A co-operative effort to implement the Information Society in Europe – Action Plan)* was rewritten at the end of June 2001, using the *eEurope* programme as a model, which set the main development tasks for the Accession Countries.

To facilitate rapid development and so that the technology could make people's lives more efficient it was necessary to have a comprehensive policy. This was the objective of those who worked out the *eEurope+* programme. This document, which was ready by the end of June 2001, contains only 32 pages but it is a very thorough and concise action plan. The Eastern and Central European countries indicated their intention to join the *eEurope* programme as early as the conference held in Warsaw in May 2000, in such a that they would construct an action plan similar to the *eEurope* programme for their area with the help of all the Accession Countries.

In addition to the candidate countries, Cyprus, Malta and Turkey supported the work on the preparation of the programme in February 2001; thus three extra countries were involved besides Bulgaria, the Czech Republic, Estonia, Poland, Latvia, Lithuania, Hungary, Slovakia, Slovenia and Romania. The 13 countries that joined the *eEurope+* programme were then comparable to the EU15 in regard to their aggregated areas and numbers of inhabitants, that is, the size of the potential market they represented. It seemed a realistic assumption that if all the 28 countries implemented the targets of *eEurope* or the *eEurope+* programmes, then Europe would become the most developed knowledge economy and a full knowledge society.

Within these developments one main task was to construct the framework for a unified regulatory structure to assist the transition to the new economy. By the time the details of the *eEurope+* programme were settled, most of the Accession Countries already had their own national information strategies. The only exceptions were Albania, Macedonia, Hungary and Slovenia, but these countries started to plan their own national programmes too. *eEurope+* made it possible to harmonize these existing national strategies with the official information programme of the EU and the *eEurope*, thus the *eEurope+* programme was prepared, as a common, hybrid programme. The drafters of the Action Plan thought that the problems of harmonisation could be solved if they included all of the targets of the EU programme, but for their execution they would set their own internal deadlines and monitoring methods. The information programmes of the 13 Accession Countries considered the following targets as priority areas (with some amendments).

0. Creating the basis for the information society:
   a. Affordable telecommunication services for all.
   b. Adopting sections of Acquis, the common *European* regulation relating to the information society.
1. Cheap, quick and safe Internet.
2. People and skills must be the subject of investment.
3. Encouraging the use of Internet and the protection of the *online* environment.

The above general targets – except for point zero and the environmental objective – were the same as those of the *eEurope* programme. Each country had to launch clearly specified actions with exact timing in order to achieve these objectives. The execution of tasks had to be timed for 2002 and 2003, after the first results of the *eEurope* programme had been achieved. The main target of the programme was to minimise the digital gap within the European Union. However, the Union could not guarantee their intended development by adopting their limited programme to achieve the information society: it would have been necessary to modernise the whole economy, reform the market processes, make the operation of government more transparent and change the public system of communications. Building the information society was conceivable only as part of a thorough programme of modernisation.

eEurope2005 – The programme of broadband Internet

For Europe in 2002, it was obvious that the future information society had to be a socially unified society. In the Action Plan of the *eEurope2005* programme, which covered the period after the *eEurope* and the eEurope+ programmes were closed, the aim of "information

society for all" did not refer to the building of the infrastructure and the networks, but more to the content accessible on the Internet and to the new services. Thus quality became more important than quantity. The decision-makers of Europe expected to make changes in the main trends of their information policies and European institutions, because of this change in their approach. The message of the new Action Plan was the following: the Member States had to support broadband Internet services and also had to encourage secure broadband Internet access for everyone.

The European Commission submitted the new programme to the European Council at its meeting in June 2002. According to the programme, Europe pledged to do its utmost to realise the objectives of the programmes on e-government, electronic education and healthcare services, dynamic e-commerce environment and online public services. The Action Plan set the deadlines for completing the tasks in 2005. All of the *eEurope* programmes were part of the Lisbon strategy, the objective of which was to enhance competitiveness, to form the basis of a knowledge-based society, and to raise social cohesion and employment by 2010 as its final deadline.

The effects of the Action Plan are to be seen in the following four areas:

1. As a policy task any national and European regulations should be reviewed if they hinder the execution of the targets of the Action Plan.
2. The *eEurope* programmes started a process which facilitated the exchange of experience and called attention to the correction of mistakes.
3. *Benchmarking* helps to supervise processes so that the set objectives will be executed. Gathering data `ensures continuation of effective execution and is required to facilitate a general evaluation by the European Council due each spring. Benchmarking set objectives for gathering and servicing time-based, comparable and reliable data.
4. In order to achieve the targets set in the Action Plan, it was essential to co-ordinate the information policies of the Member States.

The European Commission asked for the co-operation of the private sector and of the Member States in the following main target areas to facilitate the implementation of the Action Plan:

- modern online public services (e-government),
- e-education,
- online healthcare services,
- dynamic e-commerce environment,
- secure information systems.

4. The *i2010* Initiative: The European Information Society for Growth and Employment

In reviews for the implementation of the supranational Action Plans, the state of development of information services in the various nations of Europe in 2005 showed very uneven progress – despite the success of the *eEurope2005* programme. The state of development of European information society did not indicate that we would become the world leader. The "eurocrats" of the Union realised that the resources allocated for implementation of new

tasks were exhausted and that the Union's ability to regenerate itself had severely decreased. Due to a decreasing rate of economic growth, the implementation of targets for social cohesion and full employment had failed. New challenges appeared brought on by the shrinkage of the IT industry in Europe, the accession of the new Member States, the appearance of new technological opportunities and the strength of new competitors. The Commission changed in 2004, and this coincided with the final year of the *eEurope* era. The Union had to face the reality of a "multi-speed Europe" which had not changed in spite of all their efforts and they still lacked any central organisation which could enforce Union decisions at national level.

In November 2004 under the presidency of José Manuel Barroso, the European Commission chose to introduce a policy of renewal. Nothing proves this better than the choice of the Commissioner, Ms. Viviane Reding, made responsible for the building of the information society, who came from the media world and announced the building of a "mediatised information society" in the new policy document *i2010: European Information Society for Growth and Employment* which was published in June 2005. The new programme – as its title suggests – is not part of the *eEurope* programme family any more, yet it preserved some elements from the targets of the *eEurope2005*, for example, the promotion of broadband Internet usage while ensuring the quality of content for the users.

The Wim Kok Reports form the basis of the new trends (Kok, 2003a, 2003b, 2004), which sharply criticize the Lisbon targets of 2000. The report of 2003 criticised Lisbon by analysing the accession process: "The EU has to re-invent itself again […] the Lisbon targets […] are grand words which were not followed by structural reforms". The report started with a labour policy orientation, which was accepted in March 2004, which still assumed the Lisbon targets to be attainable. However, the revision at the beginning of November had accommodated this view and further proposed a new orientation strengthening the following five areas:

- Strengthening and mobilising the European research community as part of the knowledge society, making research and development the highest area of priority and promoting innovation.
- Strengthening the internal market of the Union.
- Improving conditions for entrepreneurship.
- A more adaptable and inclusive labour market especially in regard to those who can be reintegrated through lifelong learning including the elderly.
- A sustainable future in respect to the environment.

Although reaching the Lisbon targets by 2010 seemed to be unrealistic, or even impossible for the new political elite, the new tasks are proposed with the intention of establishing the world's most competitive knowledge-based society and economy. A more thorough analysis suggests that giving up the grand targets openly, would mean the tearing apart of the framework on European thinking and would smash to atoms the message to countries and other power centres: the European Union wants the power to decide the processes and to lead them, and their existence still has to be reckoned with. Thus the Barroso headed European Commission decided to restart the Lisbon strategy, naming economic growth and the creation of workplaces as main priorities. Pursuant to this, at its spring session in 2005 the European Council defined its position saying that sustainable growth depended on knowledge and innovation and for this the application of information and communication technol-

ogies was indispensable in public services, and in small- and medium-sized enterprises as well as in households, thus an "inclusive" information society had to be built.

The European Commission defined three priorities in order to achieve these objectives:

1. Building a single European information space.

This priority was to be achieved through technological development, the mass application of ICT and digital convergence. In order to form a single European information space, the following challenges had to be overcome:

- Speed: ensuring broadband Internet services and promoting them.
- Rich content: guaranteeing security: setting up the necessary legal background in order to formulate contents of a higher standard.
- Interoperability: ensuring interconnection between the various systems, platforms and devices.
- Security: the battle against illegal contents, prevention of fraud, increasing users' trust.

Objective I. can be developed through the building of a single European information space, which is affordable, secure and has broadband communication. This will offer a rich and colourful content, and digital services.

After deciding on what comprehensive targets to aim for, the Commission drafted the individual tasks in relation to the schedule:

- Further measures were needed to review the directive on television without frontiers up to 2005.
- General regulation of electronic communication, putting forward the question of radio frequencies and by 2006, the development of an effective strategy on frequency management.
- The development of the interoperable system of digital rights.
- Articulation of strategy for a secure information society up to 2006.
- Finally, reviewing the Community law relating to information society and media services up to 2007.

2. Investment in research on information and communication technologies and to encourage innovation.

The European Union owns one third of the world's ICT industrial output, but the rate of increase is lagging far behind the rate of growth in India and China. The selling of products in the Union is increasing by only 5% annually. Europe preserved its first place in the world in electronic communication (in the areas of nanotechnology, micro-systems and in the so-called embedded systems), but the expenditure on ICT research continuously falls behind our competitors. So objective II could be paraphrased in the following way: invest in high standard research and innovation in the area of ICT, and catch up with Europe's competitors.

3. Establishing an "inclusive" European information society.

More than half of the population of the Union is integrated in the information society to only a minor degree. Social, economic and territorial cohesion is indispensable for the proper operation of the Union. In order to establish this cohesion, we have to build the information society. The ageing population of the Union will present it with severe demographic problems. In resolving these problems – by introducing part-time employment for the elderly or by helping people to spend their free time usefully – information and communication technologies may be especially useful.

Summarising: objective III. aims to establish an "inclusive" information society that offers high standards of public services and improves the quality of life.

In order to achieve these objectives, the Commission provides a guide to access to electronic services and the broadband Internet-services (1); the Commission had an e-government Action Plan developed by 2006 for ICT-based public services (2); it named the ICT initiatives that should function as "flagships" up to 2007, emphasizing the following issues; the needs of an ageing population, safe and clean transport and of cultural diversity (3); it articulates a proposal from now to 2008 on social inclusion (eInclusion), focusing especially on problems arising from differences in knowledge and diversity because of disadvantageous geographical locations (4).

The European Commission makes proposals to achieve the targets discussed above, allocates Community resources to finance strategic research, supports the launching of services for all the citizens of the Union, while the Member States develop the legal system within their own authority, finance research projects relevant for them, appear in the ICT-market as investors, undertake the development of new public services and elaborate long-term strategies. The so-called **"open method of coordination"** connects the governmental and non-governmental players, it gives them common objectives and the means to exchange their experience and cooperate in installing the necessary measures and solutions. The Commission executes a rolling plan and tries to adapt to the new needs identified in its development policy.

SUMMARY

In this chapter we showed how the strategy for building the information society was first defined (briefly: information strategy). The reader was made familiar with the new quality of policy planning in this area that appeared at the beginning of the 1990s, raising IT from its previous subordinate position and bringing in the development of information oriented public utilities and the informatisation of key sub-systems of society (e.g. education, healthcare) and proposing development strategies for the information industries, to take sector management to a higher level. The strategy of building the information society can be complete or partial, according to the number of conditions it fulfils out of seven (only a partial strategy can be claimed if a mere three or four requirements are fulfilled).

Then, the circumstances leading to the publication of the Bangemann Report were examined to show why it might be claimed that 1994 was the year when the Union came of age.

Next, the main stages of the changes in policy between 1994–1999 were outlined which led to the coining of the slogan "information society for all", while social aspects and related tasks received increasing attention alongside objectives previously centred only on the economic aspects of development.

Between 1999 and 2005 successive *eEurope* programmes directed the main lines of development of information society in Europe. Strategy concentrated on the Internet, which materialized in a series of programmes in sequence and a related series of Action Plans at three year intervals. Conditions for the broadband infrastructure were established by Romano Prodi when he was President of the Commission before he was replaced by Jose Manuel Barroso in that position. With Barroso, the strategy of the European Union for building the information society changed again. These changes and the main directions of the new strategy in connection with the programme of the i2010 initiative were outlined.

The programme indicated something of a return to the grassroots, because it placed at its centre the building of a single information space, research and development, the building of an inclusive information society. In order to accomplish these new tasks in accordance with the terms of the Lisbon targets were assigned which sought to make Europe the most developed knowledge-based economy in the world.

The Union probably will not change its policy and practice organised to achieve the information society, setting the objectives and creating the programmes will take place centrally on a supranational level connecting national action plans to those programmes. However, in consequence a "multi-speed" Europe will continue: the various Member States will have variable degrees of success in implementing common programmes and will only achieve the intended transformation in diversity, not together.

REVISION QUESTIONS

1. What is information strategy and how can we discriminate a limited from a complete strategy?
2. What is the main focus of the Bangemann Report?
3. What are the key documents of the *eEurope* programmes and how do they differ from each other?
4. What policy and programme is laid down by the i2010 information strategy?

BIBLIOGRAPHY

1. Key bibliography

Liikanen, Erkki (2006): *Policies of Transition to the Network Society in Europe* (in: Castells, Manuel – Cardoso, Gustavo (eds.): The Network Society – From Knowledge to Policy, Center for Transatlantic Relations, Washington, D.C.)

2. Optional bibliography

Bangemann Report (1994): *Europe and the Global Information Society* (http://ec.europa.eu/idabc/servlets/Doc?id=18174, accessed 13 July 2007)
eEurope 2005 (2002): *An Information Society for All* (http://ec.europa.eu/information_society/eeurope/2005/all_about/action_plan/index_en.htm, accessed 13 July 2007)
eEurope (2000): *An Information Society for All* (http://www.e-europestandards.org/Docs/eeurope_initiative.pdf, accessed 13 July 2007)
eEurope+2003 (2001): *A Co-operative Effort to Implement the Information Society in Europe – Action plan* (http://ec.europa.eu/information_society/eeurope/plus/index_en.htm, accessed 13 July 2007)
i2010 (2005): *A European Information Society for Growth and Employment* (http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm, accessed 13 July 2007)

SZILÁRD MOLNÁR

eGovernment in the European Union

INTRODUCTION

Although a number of new concepts and expressions have originated in the field of information society, eGovernment is considered to be one of the first and, because the whole field is rapidly developing, this concept is also constantly changing.

Today, eGovernment has become an indispensable tool in reforming state administration and the work of local government, it is increasing the satisfaction of citizens regarding services, and creating a more flexible, transparent, public administration. The European Union's relevant guidelines for its Member States stress the importance of eGovernment.

In an ageing Europe, developing competitive industry is extremely important, when we consider stagnating economic development and the consequent need to reduce social expenditure. As well as the policy of creating a citizen-centred public administration, promoting our industrial competitiveness in international markets is a central theme of the newest eGovernment thinking. The main aims are to increase effectiveness, implement the necessary structural changes and reduce administrative costs.

The role of government and public administration is becoming more and more important, as the state's potential as an active service provider contributes to any improvement in economic capacity in international markets. Nowadays, there is a lot of pressure to modernize public administration: on the one hand, public administration itself must become efficient; on the other hand, a more efficient public administration serves to make the economy and society more competitive as well. Creating good governance is possible through a "service provider" public administration that reacts promptly to changes, is flexible and able to meet the demands of users.

However, the successful realization of this may be hindered by the passive resistance of the *back-office* side of governance service providers, as well as the unsatisfactory quality of the *front-office,* customer-side service providers, and a lack of interest shown by citizens.

The first web home page of the United States government opened just 10 years ago, and at first it provided only static information. Since then, a process of professionalisation is underway, and with it the age of "amateur" eGovernment services has ended:

- systematically built and accessible fields of knowledge have been developed;

- eGovernment activity has become institutionalised as a profession (international organisations, comprehensive programmes, specialized periodicals, specialist institutions, awards/prizes);
- the specialization of relevant professionals has accelerated;
- a whole battery of training programmes have started across the world;
- the research infrastructure of this area is becoming stronger and stronger;
- governments are starting to act like large companies: on the one hand, prioritising innovation, and on the other hand with regard to the planning, implementation and management of programmes.

1. Experiments in definition

According to the definition given by the European Commission, **"eGovernment"** means using the combination of information technology, organisational changes and new skills in public administration. The aim is to improve the quality of public services, reinforce the democratic process and support community objectives. According to the Commission's initiative, eGovernment is:

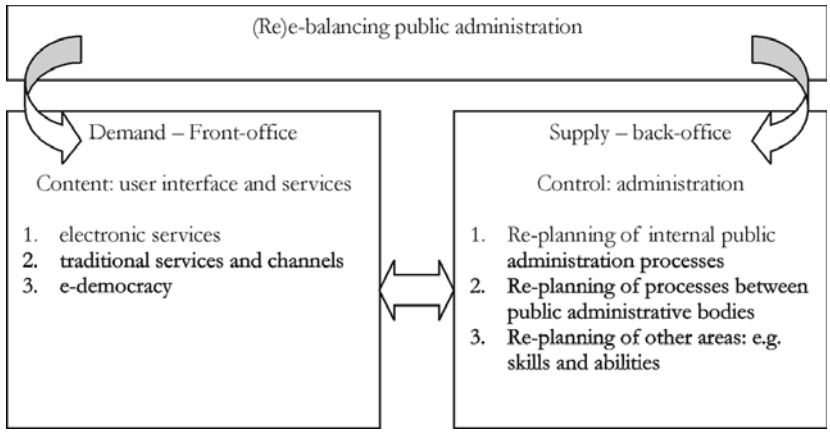
1. open and transparent: public administration capable of comprehending citizens' expectations, and it is accountable and open towards democratic participation;
2. cannot exclude anyone: user-centred public administration must reach everyone with personalised services;
3. effective public administration: operates to use taxpayers' money in the most efficient way saving time and cost.

According to the resolution of the European Union, eGovernment consists of the following three activities:

1. the use of infocommunication tools in public administration,
2. the reorganisation of work processes and operational units to ensure the modernisation of public administration,
3. training of civil servants and government officials as well as customers (citizens) in the use of new tools and technologies.

Public administration may be divided into two main areas, namely: the service-side *(back-office)* and the customer-side *(front-office).* The balance between the two sides – the distribution of public goods (the content) and administration (control) – can be achieved with the help of eGovernment by the system that can be seen in the figure.

1. Figure. The two sides of eGovernment



Source: Millard, 2003

Today, the expression "eGovernment" is used as the collective name for a, complex social and technical system, often including the following components:

- the reform of public administration;
- the technical modernisation of public administration;
- transforming services and the channels through which they are delivered, and making them multifunctional;
- developing an institutional partnership relationship between (local) government, citizens, and their local communities.

In practice, eGovernment means a new culture, a comprehensive and radical transformation in the course of which public administrative organisations make use of all the possibilities of electronics in order to improve the availability, quality and transparency of public services, and try to reduce the costs of public administration. This is in direct opposition to those frequent misconceptions concerning eGovernment, namely that the letter "e" only implies "electronisation", i.e. computers and software. "Electronic government means the comprehensive, smooth reorganisation of processes and endowing them with opportunities made possible by new technologies, whereby administrative and governmental tasks can be performed on the interfaces of agencies, citizens and politics, as well as within and between government agencies" (OECD, 2005: 15–16).

EFFORTS OF THE EUROPEAN UNION CONCERNING ELECTRONIC GOVERNMENT

The development of a transparent public administration, capable of increasing competitiveness, is unimaginable today without the use of eGovernment tools. Public services must be transformed and made more efficient to fulfil the needs of citizens. Numerous foreign examples all show that the modernity of public administration is in direct proportion to the ex-

tent of the introduction of eGovernment. It is because of this realisation that, this has become one of the central themes of discourse concerning the information society, especially in the European Union in recent years.

The first milestone in eGovernment's establishment was the ambitious Lisbon Strategy, launched by the European Council in March 2000, the grand aim of which was to make Europe the world's most competitive, knowledge-based economy by 2010. This Lisbon Summit can be considered the cradle of eGovernment developments, as the first step towards becoming the leading economy in the world lies in the modernisation and simplification of regional, nation state and supranational-level bureaucracy, and all public services. This may be regarded as the foundation stone of modernisation. In the *eEurope* documents which represent the keystones of the information society's construction, building *online* public services is only one of several areas of major importance, although in the action plan *eEurope2005*, it had become one of the five main priorities.

When Europe arrived at the chronological halfway stage of the Lisbon Strategy's programme, several criticisms were voiced saying how unrealistic the aims were. At the end of the year 2004, all around the Union, there was a lot of discussion about the so-called Wim Kok Report (Kok, 2004). The professional comments, which received a lot of publicity, were very critical of the Union's policy concerning information society and technology, urging the complete re-examination of earlier proposals However, not many people predicted what actually happened: a public admission of the Lisbon Strategy's failure. When the Barroso-led Commission came into office, a decisive change of policy paradigm took place in the field of information society and eGovernment. New, more realistic foundations were created in the European Information Society 2010 programme. The "3i" programs of Viviane Reding, European Commissioner for Information Society and Media, announced the creation as a priority of:

1. a European *Information* Space without frontiers,
2. ICT-based *innovation* and investment,

as well as

3. social *inclusion* and a better quality of life.

One of the keystones for developing the most competitive knowledge-based society and economy is the building of *online* public services, these, according to new guidelines, require the close cooperation of the Member States.

Reding believes that the key to realizing eGovernment lies in the supranational-level treatment of the following areas:

1. creating interoperability between secure identity management and the systems,
2. spreading best practice,
3. developing and efficiently operating Pan-European services.

The EU conference organised in Manchester in November 2005 reflected a change of political priorities, since it shifted the focus to centre on the citizen in the course of developing eGovernment. Not one citizen may be left out of using eGovernment services, no matter what ICT system he/she may use, or wherever he/she may live within the territory of the European Union. The Commission's i2010 eGovernment Action Plan of 2006 defines concrete milestones to be met by 2010:

- The use of electronic identification and certification systems should be made possible for all European citizens, enterprises and public administration systems.
- Development of a reference and certification framework is necessary to enable the uniform use and application of electronic documents by Member States.
- The social inclusion of all citizens must be achieved with the help of ICT, in the spirit of the eGovernment slogan: "by 2010, not a single citizen may be left out of the process".
- Easy accessibility to all public information and services of general interest must be ensured.
- To make this work, the identification of obstacles standing in the way of accessibility and appropriate changes to the situation is a necessary task for every Member State.
- An important aim is the reduction of administrative burdens on citizens and enterprises and building more effective public administration systems in the spirit of transparency and accountability.
- We should aim to create supranational-level services with wide-ranging effects (focussing on full-scale e-public procurement).
- The installation of data exchange and interoperability between governments should be accomplished by introducing open standards in the field of eGovernment.

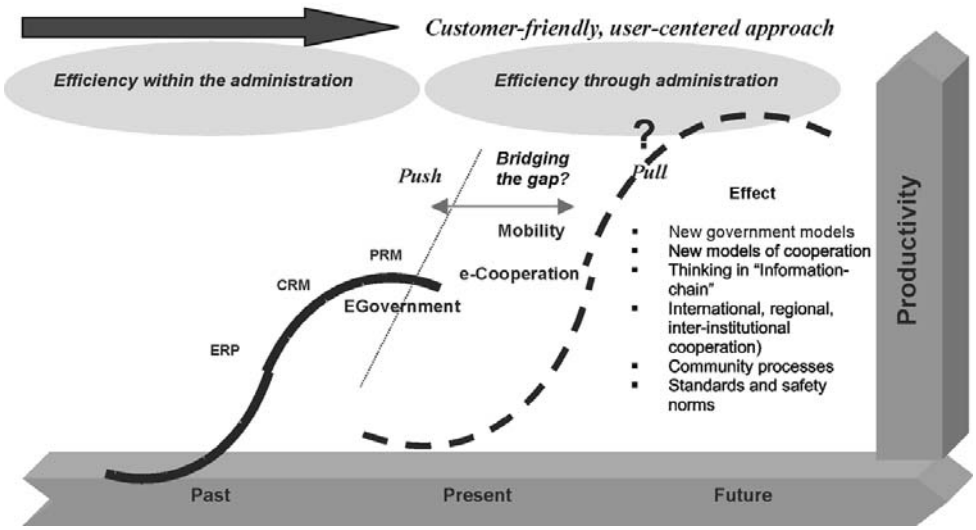
Within the Union, cooperation between Member States does not extend to the development of uniform public administration, because the achievement of common political objectives remains within the prerogative of national powers, as intended by the founders of the Union. Consequently, the Union "borrows" the historically different administrative systems of the Member States for the achievement of common objectives, and strengthens its position in the field of supervision control.

1. Paradigm change in eGovernment initiatives

It is interesting to note that the most modern, well-built *online* services are the ones where the state has a direct material interest, such as tax collection. Those services, on the other hand, which place responsibilities on the institutional system (e.g. granting authorizations, various registrations) and do not "produce" direct income, are not at the centre of development programmes.

In order to proceed, radical changes should be made in eGovernment initiatives. While administrative efficiency could be increased with the treatment of traditional CRM (Customer Relationship Management), PRM (Partner Relationship Management) systems and the introduction of ERP (Enterprise Resource Planning) MRP (Manufacturing Resource Planning) solutions that increase company resources, these methods are not suitable for developing the service-side (back-office) processes (see figure below). The increased cooperation of administrative systems has become a necessary condition for the further development of customer-side *(front-office)* services. This means a new challenge for eGovernment initiatives; in order to proceed there is a need for paradigm change.

2. Figure. eGovernment paradigm change



Source: Cap Gemini Ernst & Young, 2002 (referred by: Verhaak–Wauters, 2003)

The essence of paradigm change is that in the *pull* model, it is the customer who is in the centre; public services must be shaped according to his/her expectations, needs and opportunities. A very efficient tool, and not aim, for achieving this may be to exploit the advantages of new technology. Citizens should have greater freedom in using personalized services in the areas of education, health, social security and taxation. The customer-centred approach requires that the processes of public services offered by institutions must be revised and simplified, and the regulatory background should also be made simpler. Creating connections between institutions and systems requires the harmonisation of the different databases, the centralization of customer identification and prioritising standardization and **interoperability**. There is only one way in which paradigm change can be successful: that is if we manage to create a horizontal operational model for the levels of public administration and government bodies and conditions for effective co-operation between the administrative systems. As a result of this, a more modern, streamlined public administration may be created operating in a more transparent legal environment.

Thus, increasingly, it is the citizens who are at the centre of efforts for development. It is for them that state administration – in cooperation with the business sector – develops user-friendly applications (*push* model): naturally, this would be unimaginable without the achievement of interoperability between public organisations (*pull* model). The user-centred approach for developing services has become a priority as a consequence of the programme for socializing information strategies, which was first formulated in the *eEurope2005* programme to be implemented prior to *i2010*.

WHAT ARE THE MAIN CHARACTERISTICS OF ELECTRONIC GOVERNMENT?

Electronic government is made up of two components:

- Renewal of the internal operation of public administration institutions – **back-office**, i.e. service-provider side.
- Communication between these institutions, the population and the business sector – **front-office**, i.e. customer-side.

Front-office service means the direct relationship between public administration and its "customers". This is the actual interface where the "exchange" of information takes place. The typical infrastructure of the customer-side is the Internet (homepage, portal) and the telephone network.

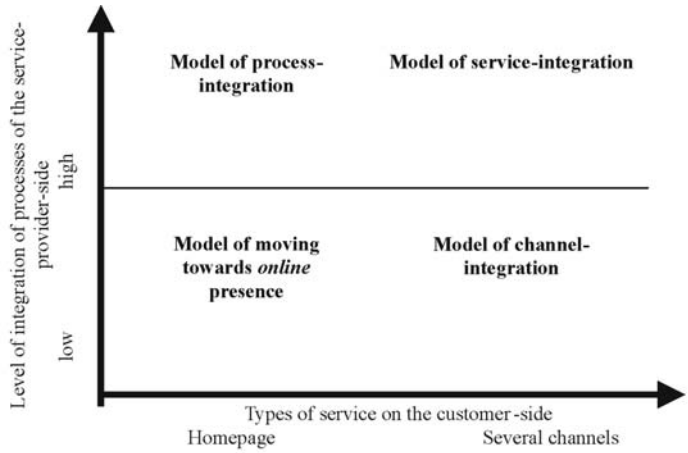
The task of *back-office* services is, on the one hand, to "serve" the *front-office,* to receive and process the documents from the customers, to ensure all the necessary conditions for integrated administration and processing (*workflow,* integrated databases, electronic signature, data protection, data safety etc.), then to return the result or results to the *front-office* modules. It is also the task of the *back-office* to support the efficient operation, management and control of public administration institutions and local government institutions.

In the past, the importance of the two components has been unequal. At first, owing to the enthusiasm following the appearance of the Internet, attention was directed towards *online* presence, and then came the increasingly efficient diffusion of information about public administration. At the present stage of the process, the popularity of web homepages is now widespread.

There are four possible forms of the relationship between *back-office* and *front-office,* that is why these indicate four different strategic models (Top of the Web Survey, 2003):

1. The model of "moving towards online services": this is characterized by a low degree of integration between different processes, as well as by a service based on a single homepage (channel). The main objective is to have the existing services appear online as well. This has the already mentioned advantages (time saving, flexibility).
2. The model of "channel-integration": this is also characterized by a low degree of integration on the service-provider side but customers can access the services through several channels. The emphasis is on systems for channels (on-line, off-line), and on various systems used for increasing effects and attracting attention (links, pop-up windows, etc.).
3. The model of "process-integration": here the level of integration on the service-provider side is high, the number of channels used is limited to one web homepage. Emphasis is on simplifying processes, abolishing parallel systems and creating automation. As a consequence, the government can function more efficiently (faster, more transparent administration), and this has a positive effect on services, as well.
4. The model of "service-integration": this has all the advantages of the former models, but as well as the high-level integration of the back-office, customers are served by as many information service channels as possible. The number of times citizens have to come into contact with the public sphere (often for the same data) is minimised.

3. Figure. Development strategies of e-services



Source: Top of the Web Survey, 2003

The real challenge is the change from one phase to the other, since there is an "evolutionary break" between the different levels.

In the course of the transition from simple presence to the interaction phase, the task is to bridge the so-called *fear-gap.* This means that the transition from giving simple static information to *online* communication is causing the public administration bodies serious problems, since this poses data security issues and implies serious learning tasks.

There is an *organisational gap* during the transition between interaction and transaction. In this phase, the public administration bodies, hitherto working in relative isolation, have to contact one another more and more often, and solve certain problems together, since the more complex transactions usually involve several areas of public administration.

Finally, the change from transaction to transformation is possible through the *value-transformational gap,* which means thinking according to the citizen-centred model, cooperation between the units of public administration, perfect information-division, the precise definition of the scope of responsibility, and the efficient management of the consequent legal and ethical questions.

1. What are the levels of maturity of eGovernment?

At the moment, we can distinguish between five levels of maturity in the field of eGovernment services (Cap Gemini Ernst & Young, 2002; Wauters, 2006):

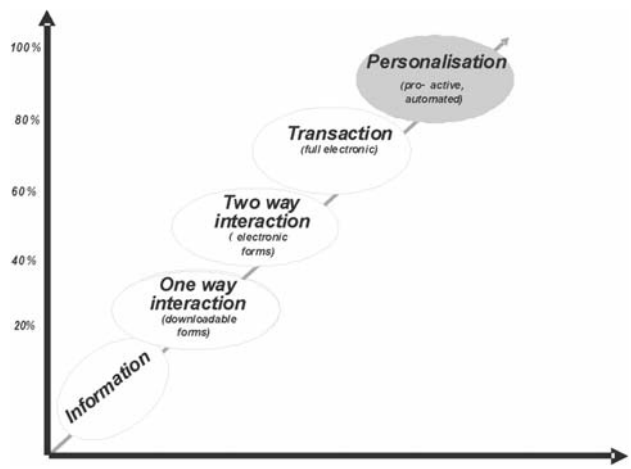
Stage 1: **information:** the customer receives only general information about the process of the case in question and the necessary documents.

Stage 2: **one-way interaction:** as well as the above, it is possible to download and fill in electronically the documents (forms) required for dealing with the case, with or without guidance control, but handing in the documents takes place in the traditional way.

Stage 3: **two-way interaction:** electronic data can be entered and it is also possible to check/advise on the entered data. Application in person is not necessary to initiate processing of the case, but delivery of public administration documents (e.g. certificates), receiving decisions, decrees etc., and the payment of dues and fees connected to the case all take place in the traditional way.

Stage 4: **transaction:** service ensuring the whole transaction (administrative process) online. The citizen receives the form *(document)* appropriate to the case electronically, and payment of the relevant fees or dues can also be arranged electronically.

4. Figure. Level of development of eGovernment services



Source: Cap Gemini, 2006

Level 5: **personalisation:** pro-active, customer-centred service. This fifth level of maturity will be introduced in the European Union from 2007. In the case of regularly used services such as tax and contribution declarations, it is completely unnecessary to submit personal data again and again when public administration already has them: in these cases, public administration is able to supply forms that have already been filled in.

2. Multi-channel access

Electronic public administration cannot reduce the freedom of choice of citizens, since the state cannot exclude anyone from accessing and using public services.

By the word “channel”, we mean the way in which citizens can gain access to services offered by the public sector – personally, through the post, by telephone, fax, on terminals in public places (kiosks), with browsers on personal computers.

The development of public administration portals is primarily adjusted to the expectations of the population and those of enterprises. This, however, is just the tip of the iceberg.

Government reorganisation can ensure transparency and the participation of citizens in political decision making (especially at a local level). From this view, the renewal of processes is more important than the electronisation of existing processes. This means people can effectively access services, and exercise their rights and duties. In order to be able to do this, an extremely high degree of integration is necessary between the different services and the various levels of administration.

eGovernment does not mean that in the future, the population will have to spend more time sitting in front of computer monitors, nor does it mean that all transactions performed by the state must be done via the Internet. EGovernment must make the functioning of the public sphere simpler, and reduce, wherever possible, the necessary number of operations performed in the course of a task. One of the beneficiaries of the resources saved in this way would be the citizens themselves.

3. Customer-centred thinking

The government, as opposed to enterprises, cannot choose its customers, and people are in fact more than just customers. They are connected to the state as taxpayers, users of information and in many other capacities: as citizens, they want to be well informed, they want to take part in political processes, and they wish to express their opinions concerning certain issues.

Developing a customer-centred portal means that the implementation must be adapted to the needs of future users regarding content and the nature of application. Good portals are those that apply a mixture of two different approaches: they are "life-situation" and "target-group" oriented. Governments show a preference for the life-situation approach: they adapt the services of public administration to citizens' needs (by making sure, for example, that the desired information and services can be found with the help of key words). Being target-group-oriented means that services are differentiated according to other aspects besides that of a particular life-situation; for example, the various user groups (citizens, enterprises) or users of differing expertise (experienced or beginner) or with different rights.

4. Let the "e" become unstressed

It is indispensable that technology be "put in its proper place", in other words, that technology should not determine the direction of development. Based on the experience of experts, the success of eGovernment processes depends on technology for 20%, on the restructuring of processes on the service-provider-side for 35% and on the attitude of management for another 40%.[1]

We should also take into consideration that deeper social and economic purposes may also be served through eGovernment initiatives. Among these purposes might be strengthening of civil society, promoting publicity and transparency, as well as strengthening democracy.

[1] Subhash Bhatnagar, World Bank, Indian Institute of Management, Ahmedabad.

5. The advantages of eGovernment

In 2004, the European Public Administration Network (EPAN) assessed the effects of the European eGovernment projects, and on the basis of the survey, it defined seven kinds of advantages that are typically the results of eGovernment development programmes.

The supply and quality of information improves

With the use of ICT, and even more with the digitisation of information, in most cases a higher quality and more widespread information fortune was created. As digital systems become more widespread, it is no longer necessary to input paper-based data in a tiring manner, since the data was already created in this digital form. The management of digital information is a lot easier too, what is more, the different data sequences can be compared and combined. With the interoperability of databases and their division between different offices, information provision improves significantly, and there is no need to repeatedly supply every authority and office with certain data.

Procedure time decreases

Digitalizing information brings more advantages than solely quality. Electronic information disclosure is faster, hence data can be made available to citizens and offices faster (and usually in a more up-to-date state). Services can ensure that the users of public administration services receive forms that have already been partly filled in. There are numerous indications that in the future, there might be no need for the work of data controllers in offices. The storage of information in electronic form may also speed up certain decision-making processes.

Administrative burdens decrease

As a consequence of these changes, there is an opportunity to reduce unnecessary administration. Instead of applying mechanical records of data, the work of civil servants can produce added value. Furthermore, in the case of the partly filled-in electronic forms (above), the burdens of citizens can also be reduced. Users need only to skim through the form, generated with the existing data, which they can finalize with a click/push of the button. Analyses of European economic policy point out that in proportion to the GDP, the measured administrative burden[2] is – at present – between 6.8% in the Baltic states, Greece and Hungary, and 1.5% in the United Kingdom and Sweden. Naturally, it is no coincidence that this burden is usually lower in countries with higher GDP. The importance of this area is

[2] For example the reporting obligations concerning the application of legislation related to enterprises.

proven by the fact that the 25% reduction of administrative burdens on enterprises, which the European Commission would like to realize by 2012, could actually lead to a 1.4–.8% increase of the GDP level.[3]

Costs can be reduced

When listing the advantages, we must not forget one of the most important aspects, i.e. improving cost effectiveness. This cannot be felt so much by the users, since what they experience is the shortening of administrative time. If, however, the user appears as a legal person, then the monetary savings in cash can be significant. The main components of cost saving could be fewer hours of work and a smaller labour force (e.g. as a consequence of not utilizing the above mentioned data controller tasks), and electronic communication could also be cheaper than the traditional method. Of course, the simplified, automated course of business does not always mean saving money, as serving customers who require individual treatment actually increases costs (time, staff).

Higher level services can be realized

The components are as follows: greater flexibility, a higher level of transparency and the management of unique, individualised cases. In the first case, we are talking about the much vaunted continuous, "7/24/365" availability: background information can be downloaded at any time, forms can be obtained and filled in without having to actually travel to the office. Even financial transactions might be possible. The most important component may be flexibility, ensuring multi-channel (paper, Internet, CD-ROM, *call-centre,* SMS, WAP, digital TV) access; that is the citizen can maintain contact with the government in a way that suits him/her the best. To demonstrate the improvement in transparency, we should mention the monitoring of cases, opportunities for better interpretation of the relevant legislation, the "monitoring" of information which gives the opportunity to make exact queries concerning the phase of a certain case or the history of an official correspondence. Even in individual cases, the management of tasks that cannot be carried out by standard procedure and perhaps serving customers who require individual treatment may prove to be profitable for the service provider in both time and money. The official may be able to spend the time saved using standardized procedures on dealing with cases that require special attention.

The last two obligations, increasing efficiency and improving the satisfaction of customers, can be synthesised since these occur almost automatically as a consequence of the advantages above. Service providers have a hard time measuring these (especially the last two) although there are some possible solutions here (for example, measuring the degree of utilisation or placing it in some kind of scale/level system).

[3] See in more detail the report containing the strategic review of better regulation in the European Union, published by the European Commission in November (COM (2006) 689).

E-democracy opens up new opportunities for the public

Modern democracies have been struggling with unsatisfactory processes for years: citizens have little trust for democratic institutions, participation in elections is low, and membership of political parties is decreasing. Many people say that that one of the greatest advantages of using new, interactive technologies is that it will help them find new ways to stop unsatisfactory processes. Technology is not a panacea, nor is it omnipotent; but with the help of the Internet, new areas of democracy will open up for citizens.

Thanks to the Internet, many users can communicate simultaneously with a lot of other people, on a mutual basis. Interactivity, the possibility of communication without frontiers plays an ever-greater role in European eGovernment activities. Primarily, widespread participation is made possible by the Internet, while at the same time, it enables the (elected) representatives to familiarize themselves with the interests of those they represent, and also, allows them to take their views into consideration in the course of the decision making processes.

On this basis the concept of **electronic democracy** can be best defined as the use of interactive technologies for strengthening democratic processes, as a result of which people may feel there is greater scope for their views and opinions, and they can be more active participants in democracy. Professor Stephen Coleman of Oxford University, who is researching electronic democracy, interprets the expression as the relationship between citizens and the government, and recommends the following definition: Electronic democracy means making use of the opportunities provided by digital technology with a view to improving the democratic process interacting between the governing power and those governed, and between representatives and those represented.

Thanks to systematic, intensive social dialogue, there is hope that democratic public culture and the willingness to participate will grow stronger, and at the same time, the understanding of democratic, political participation will become wider. Votes in elections will continue to be the main, precisely measurable scale of participation, but the communication and the discussions preceding the elections which belong to the process of everyday politics, will also be seen as an important aspect of participation.

For this reason, "real" **electronic government** is characterised by the balanced combination which ensures electronic services and the various possibilities of electronic participation. If we are to define "electronic government" as above, then "electronic democracy" can be further divided into "electronic participation" and "electronic voting" (Märker, 2005).

"Electronic participation" means not only the digitisation of existing processes of planning and decision making, its aim – with the help of information and communication technology, of course – is rather "to develop new possibilities for participation, and to establish itself as part of the new administrative and decision making culture".

According to Stephen Coleman (Coleman, 2005), the main elements of a democracy based on the activity and direct participation of citizens are as follows: the "one-to-many" type of communicative regime, direct representation based on interactivity, creating involvement in the process of political decision making, restoring trust, and reducing the democratic deficit manifesting itself in parliamentary institutions.

Information and communication technologies can facilitate the fulfilment of a deliberative-based democracy in several dimensions:

1. making the operation of the state apparatus more transparent on an institutional level by ensuring freedom of information,
2. changing the system of connections between the citizen and the state into a system of relations based on two-way communication,
3. the self-organisation of citizens, by creating networks organised from the grass roots.

Making the state more transparent at an institutional level can be seen as the embodiment of electronic freedom of information.

The transparency of the state administration's operation at institutional level is considered to be of key importance by the supranational directing bodies of the European Union, therefore the memorandum concerning the creation of the electronic government service system was prepared for the eGovernment conference held in Manchester in November 2005. This memorandum acts against the concealment of information and against bureaucracy excluding the public.

In Hungary, for example, the adoption of legislation concerning the freedom of information is a sign indicating the transparency of the state activities, while the presence of a growing number of online communities organised from the bottom up shows that there might be a consensus concerning public affairs; the citizen may change from being a passive receiver into a person whose creative activities are based on individual decisions. However, the majority of programmes aiming at developing e-democracy still originate from the government sector, apart from a few initiatives supporting special situations, the number of civil initiatives is insignificant.

The change from the system of connections between the subordinate citizen and the state to the more equal two-way relationship based on communication is under way.

The realisation of e-democracy also means, on the one hand, that electronic communication with the public authority becomes a civic right, while on the other hand, data of public interest becomes accessible in different formats, and from various sources.

The aim of the programme called *eParticipate*[4], which was started in March 2005, is to create a network between institutions of the public sphere, which increases the opportunity for citizen participation in democratic processes. The initiative is based on the *webcasting* technology, that might allow a transmission, perhaps live from the council-chamber of a local authority, with access for audio and video content as well.

In the past few years, *podcasting* has become more and more possible, and the public sphere has realized how important this is. Anyone can upload their oral (or audiovisual) message to the Internet with the help of a computer and a microphone. Governments recognized the importance of this in 2005: the Democratic Party of Singapore was the first to issue a political *podcast,* then Senator Larry Craig, of the United States of America, made it possible to download *podcasts* from his homepage, the following day, the White House provided access to President Bush's speeches in the form of *podcasts*.

[4] Complete name: *Trans-European Network for Democratic Renewal and Citizen Engagement, see:* http://www.eparticipate.org/.

The introduction of the institution of *e-petition* can be fitted into the conception of services supporting legislation *(e-Parliament).* The approach, which aims at the institutional modernisation of parliaments, can be achieved, on the one hand, through better organisation, managerially-based efficiency, openness, participation and transparency, and on the other hand, by aiming to eliminate an increasingly obvious democratic deficit, by which means we may regain the citizen's trust. In this spirit, the German Bundestag launched its electronic petition service from September 1 2005, offering every single citizen the possibility to initiate e-petitions, sign petitions written by others or express their opinions concerning any ongoing online *discussion*.

Networks organised from the grass roots up are created through the self-organisation of citizens.

The Web 2.0 revolution of today has resulted in the extremely significant advance of content generated by users. Ever growing numbers of citizens record events taking place in public spaces, with their mobile phones or handycams, then submit them on the World Wide Web. With the help of blogs and *RSS (Really Simple Syndication)* formats ("very simple information-division"), citizens are creating new contents, sharing their opinions, and posting their political views. There is a growing need in society for people to contribute to the development of the public good not as passive consumers, but rather as citizens taking part in the political discourse.

THE RESULTS OF THE DEVELOPMENT OF eGOVERNMENT IN THE EUROPEAN UNION

From March 2000, the results of the e-Europe programme's implementation have been measured in the Member States of the European Union by designated *benchmarking* activity. The essence of this method lies in comparing the results and deficiencies of the Member States with the help of standardized quantitative and qualitative indicators.

By definition, **benchmarking** means the continuous survey of different products, services and organisational practices, enabling the analysis and improvement of key processes, the elimination of errors, and improving performance as well as the definition of goals. An important tool of *benchmarking* is getting to know the "best practice", which may also lead to higher performance in achieving the goals that have been set out.

Concerning eGovernment, the survey concentrates on customer-side services. In the course of defining the indicators, a list of 20 items of public services was drawn up, 12 of which targeted citizens, while 8 of them were aimed at the business sphere.[5] The *on-*

[5] *Benchmarking* measures the online availability and "level of readiness" of the following 20 basic public services, listing them into four (from 2007 onwards, probably into five)stages of development (Cap Gemini Ernst & Young, 2002):
Public services for citizens
1. Income Taxes
2. Job Search
3. Social Security Benefits

line classification of the interactivity of these services was drawn up by the company *Cap Gemini Ernst & Young,* in their report entitled *Web-based Surveys on Electronic Public Services,* edited for the European Commission (Cap Gemini Ernst & Young, 2002).

With this method, they examine to what extent the electronic execution of services can be solved, and in the case of each service, they define the highest relevant level. The services examined are classified on a scale ranging from 1 to 4, and the service which is awarded the highest mark, 4 points, is the one where the whole administrative procedure can be done *online*. If we add up the points awarded in each service, and compare them to the maximum number of points that can be reached, we get the level of development according to the percentage, of the public services available *online*.

This method offers an easily comparable indicator regarding the level of sophistication of *online* public services. However, since it is based solely on the examination of network homepages, it tells us nothing about the degree of utilisation or the quality of services, therefore further investigations are necessary if we wish to study utilisation, and actual or potential demand.

According to the *Cap Gemini* survey of 2006, eGovernment has become a reality among the Member States (and Norway and Switzerland), the ratio of electronically available services has increased to 90%, and full-scale *online* administration is possible in 40% of all public administration homepages. The ten new Member States are two years behind compared to the EU15 countries (Cap Gemini, 2006).

---

4. Personal Documents (passport, driving licence)
5. Car Registration
6. Application for Building Permission
7. Declaration to the Police
8. Public Libraries
9. Birth and Marriage Certificates
10. Enrolment in Higher Education
11. Announcement of Moving
12. Health-related Services

Public services for companies

1. Social Contribution for Employees
2. Corporate Tax
3. VAT
4. Registration of a New Company
5. Submission of Data to the Statistical Office
6. Custom Declaration
7. Environment-related Permits
8. Public Procurement

1. Table. Percentage accessing the 20 basic eGovernment services

	2004	**2006**
EU-25	41	50
EU-15	49	56

Source: Eurostat, 2007

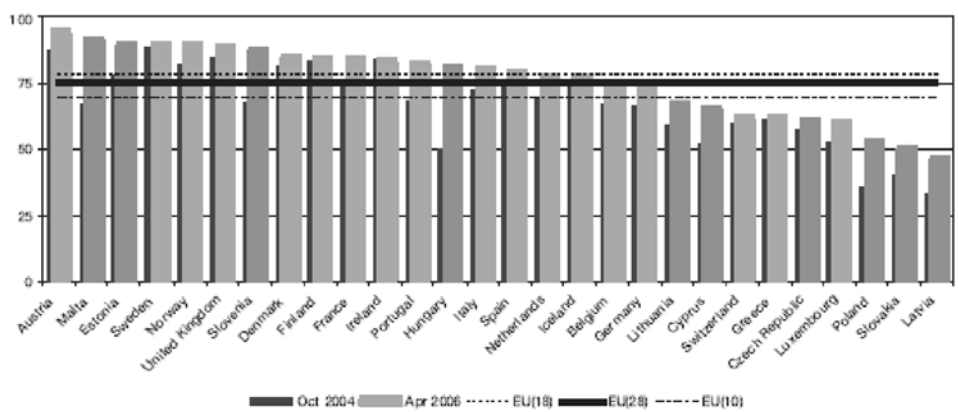
2. Table. Percentage of enterprises that are eGovernment users

	2004	**2006**
EU-25	52	64
EU-15	50	64

Source: Eurostat, 2007

The interactivity and elaboration of homepages has increased even further and the ratio of full-scale *online* administration has reached 50% (see the chapter regarding the levels of maturity of eGovernment). However, the trend is still that the development level, the "sophistication" of public services offered to companies is a lot higher than that of services offered to citizens. Every year, the report ranks the countries examined on the basis of the quantity and quality of available services. Austria caught up with the northern region in 2003, and its ascent continued, so that by 2006, it reached the top of the list. In the period of investigation, the indicator of sophistication rose by only 6% in the old Member States, while in the new Member States it rose by 16%, which shows the impetus of their development regarding eGovernment.

5. Figure. Ranking of online services according to sophistication



Source: Cap Gemini, 2006

According to the data from *Cap Gemini* for the year 2006, Hungary made the greatest progress in the previous year, from 23rd place to 14th place in the European ranking. The table be-

low shows us that the proportion of the population simply seeking information is decreasing (although it is still the most frequent activity), while the proportion of users of interactive services is increasing. It is apparent that in households with broadband Internet connection, the proportion is much higher at all levels of service, even in countries (for example in Hungary) where the use of the Internet is relatively quite low.[6]

3. Table. Ratio of the use of various online public services in 2004 and 2006 in EU-25 countries and in Hungary

	EU-25	Hungary			
	2004	**2006**	**2004**	**2006**	**Broadband household**
Contacted a public administrative body through the Internet in the past 3 months	-	24	16	17	-
Gained information	21,4	20,5	14,9	13,6	36,7
Downloaded forms	9,8	13,0	6,9	11,4	29,5
Sent back filled-in forms	5,6	8,1	4,0	5,3	14,2

Source: Eurostat, 2004-2006

NEW DIRECTIONS IN EGOVERNMENT RESEARCH

1. Focus on the rationalization of public administration

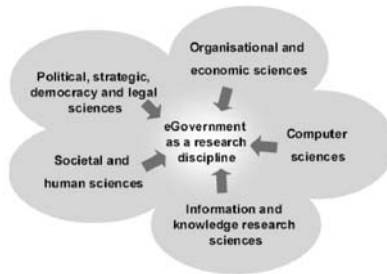
With the *i2010 EGovernment Action Plan,* the eGovernment development programmes – taking place on a supranational level – have reached a new phase. The implementation of the strategy requires from all Member States the transformation of service-side processes and organisations, in accordance with social challenges. The change in approach affects everything, so it has changed the focus of eGovernment research; the programme labelled *eGovRTD2020* has been launched, aiming to create the community administration model.

The European Commission launched the *eGovRTD2020* programme within the Sixth Framework Programme *(FP6):* its task is to direct the ongoing eGovernment research programmes into the right channels, identify the "hot areas", and map the elements that define the broader environment of eGovernment development and outline a possible scenario for the future on the basis of these.

This type of *benchmarking* investigation which aims at the complex analysis of the changes taking place in society, public administration and the economy, takes a multidisciplinary approach to eGovernment as a discipline of research. That is why the project regards the following areas of science as the foundation of *eGovernment 2020's* holistic vision.

[6] In the first half of 2007, 34% of the adult population of Hungary can be considered to be regular Internet users.

6. Figure. Research opportunities in eGovernment

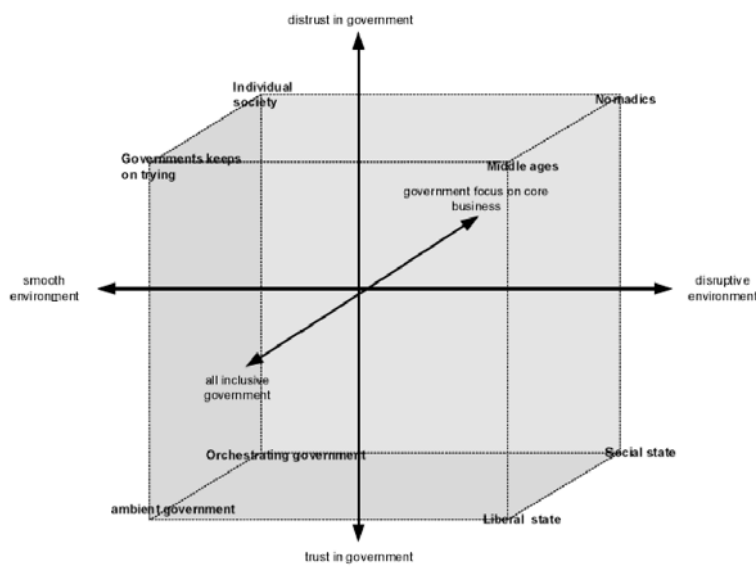


Source: Roadmapping eGovernment RTD 2020: Visions and Research Measures towards European Citizenship and Innovative Government. Fourth draft of Roadmap, 2006

The project also endeavours to map the broader environment of eGovernment development. The scenarios have been elaborated along three dimensions:

1. *Environment:* this can be balanced if it is characterized by economic growth, but recession and critical situations can have a destructive effect.
2. *Trust capital:* one of the indicators of social capital, which points to the positive or negative citizens' attitudes towards the government; that is, trust, mutuality, cooperation and participation.
3. *Government spheres of authority:* based on the government's policy of intervention. This problem area may be provoked by the government' focussing only on core business to a concentration on an all encompassing government.

7. Figure. Scenarios of eGovernment



Source: Roadmapping eGovernment RTD 2020: Visions and Research Measures towards European Citizenship and Innovative Government. Second draft of Roadmap, 2006

The eight possible eGovernment scenarios created along the three axes that intersect one another also mark the direction of eGovernment research for the near future:

1. *Orchestrating government:* This pursues a transparent, but somewhat limited policy that facilitates administration and involves all citizens and is supported by them.
2. *Individual society:* Assumes that in an increasingly atomised society people can only depend on themselves. Personal responsibility comes to the fore; the state provides only the most basic services. Since the economic market environment is very stable, only minimal compensation and complementary services are expected from public administration.
3. *Ambient government:* It encompasses a wide range of administrative activities, when the citizens' have a high level of trust for public administration. In the spirit of efficiency, the state administration acts in the interests of the public good.
4. *Government keeps on trying:* Despite the administrative steps taken in order to improve the quality of life, trust in public administration is low. There is a wide gap between the ideas of the technocratic government and the general will of society, which may be traced back to a Government failure to modernise political institutions in order to encourage citizens' participation, but this has failed.
5. *Middle Ages:* In a much divided world, the government focuses on carrying out only the most important tasks. As the level of trust drops, civil society becomes more and more self-sufficient.
6. *Nomadics:* A government with a very limited area of activity, acting in an atmosphere of distrust. Public opinion is very much divided on the usefulness of ICT: while younger people with a higher level of education accept that these technologies help to develop a more efficient public administration. However, members of the older generation do not comprehend it all, since they feel they need security in a rapidly changing environment.
7. *Liberal state:* In a state that is unable to keep up with rapid changes, people no longer trust the state. Hence taking care of oneself becomes more and more widespread. Consequently public administration can only take on the most basic tasks. Society is extremely divided.
8. *Social state:* The providing state faces the challenges of a rapidly changing, globalised world and of demographic change with the help of new, high level technological systems. The government tries to alleviate the unsatisfactory environmental effects by providing a wide scale of services.

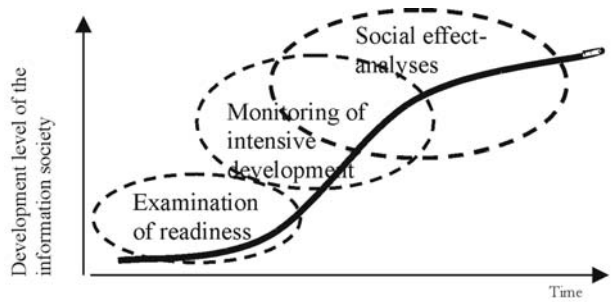
2. Measuring the effects of eGovernment

It is inevitable that in parallel with the development of eGovernment models, the development of research should follow a similar route. The emphasis must soon be centred on the study of the new developments with regard to both research questions and applications. Today, the approach is that the eGovernment services, ministries or states are ranked according to statistical measures, and the world is divided into those who lag behind and those who forge ahead. This may be insufficient, even flawed. We should proceed to examine the causes of new development, showing the possible direction ahead, and examining the social,

economic and administrative effects of policy aims. These will require new questions and new research methods; that is, a new approach from researchers, from politicians and decision makers.

We might see a parallel between the development of eGovernment initiatives and the trend of research concerning the phenomena of the information society (including those of eGovernment).

8. Figure. Model of measurement connected to the development levels of the information society



Source: Statistics of Canada, OECD, 2002

The figure shows the typical diffusion curve of ICT indicating how research follows the development curve. The initial phase is characterized by a slow rise: a basis for later development is being laid down here. Among international indicators we can find readiness rankings that fix a point of departure. The next phase is characterized by an intensive rate of development, it is the role of indicators to express the rate of this development and record the monitoring of it. In the third phase, progress slows down and reaches a near saturation state of the technologies and of access by the public. The function of these indicators is different again; they should show that the social, economic and state mechanisms are measuring these effects. To actually record, accurately, the changes and effects taking place in this information society.

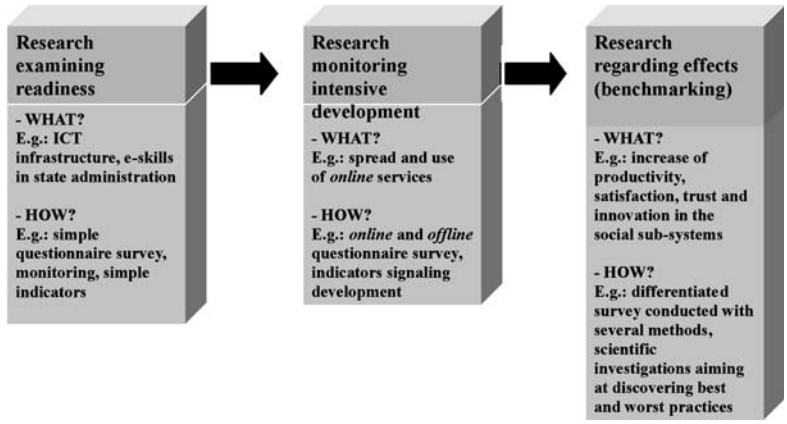
On this basis, the research into indicators of development in information society and any related investigations can be categorised into three groups:

- indicators and research concerning readiness,
- indicators and research monitoring intensive development,
- indicators and research recording the effects of the development of information society.

The rate of development of eGovernment initiatives can also be characterized by a similar S-curve, but we are aware from research results that at the moment, we are finding a radical, paradigmatic change. The motor of change being that customer-friendly, user-centred services are developing and in the interest of increasing effective cooperation between the various public administration bodies, the different regions and the different states is getting stronger.

Of course, we can draw a parallel between the two development curves, and a statistical system can be drawn up into which the research concerning eGovernment initiatives can be input. In this system, we can differentiate between the three consecutive subject areas:

9. Figure. Development of research regarding initiatives of eGovernment



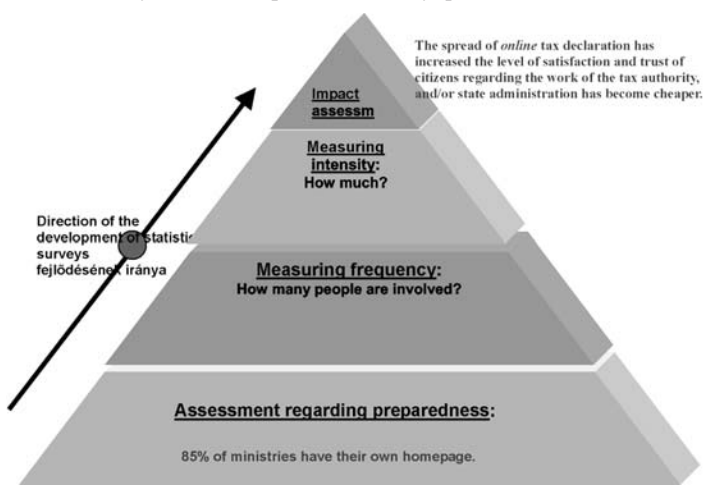
Source: Korte, 2003

The direction of development shows us that research is moving towards the better investigation of the real effects of eGovernment development programmes. The important questions are no longer about how many computers there are in households or offices, but the following, for example:

- What effect does all this technical and social change have on the quality of life?
- How do the people's satisfaction and their trust in public administration change?
- To what extent is the efficiency of public administration increasing?

Thus, relevant change to the most important type of research question and the corresponding gathering of statistical data can be summed up in the following figure.

10. Figure. Statistical surveys and development of the key questions



Source: Korte, 2003

All this presents a three-part system of requirements in those various countries when involved in eGovernment research and into information society in general:

1. information supply regarding the country's state of preparedness through investigations of readiness,
2. monitoring the intensity of development in the interest of comparative analyses,
3. monitoring the changes that have taken place in society generally and in the economy and public administration, in particular through the widespread use of information and communication technology.

The investigations must examine society and the economy in a sensitive, complex way, revealing then analysing the phenomena and then, by determining the directions of development and implementation, they can assist social and economic policy decision making.

The newest developmental phases of eGovernment demand a move from research that expresses simple quantity to a more scientific, benchmarking type of research that examines the effects of spontaneous development and the economic, social and administrative effects of development programmes. There is a growing need for more differentiated research and analysis, underlining the need that for those countries in the *push* phase, impact studies regarding the population's reception of eGovernment services are especially important.

SUMMARY

As the European Union's global competitive position has become weaker, it has become more and more important to stress that a major effect of information and communications technology systems is that they generate economic growth and activity. It is in this spirit that the European Commission's initiative, COM(2005) 229, entitled *i2010: A European Information Society for Growth and Employment,* was drawn up, and the first research was published at the end of 2006. The third pillar of this initiative, which urges stronger action from Member States, advocates the promotion of social integration by, the development and social access to better electronic public services. The significance of this topic is that according to certain scenarios, the GDP of the EU25 countries may increase by 1.54% (that is by 166 billion euros) between 2005 and 2010, thanks to the eGovernment research and development programmes. This has a very good chance of happening according to official calculations the Member States of the European Union – with the Scandinavian states and Great Britain in the lead – spend almost 12 billion euros a year on the development of eGovern- ment (EU: Europe spends 11.9bn 2006).

Nowadays, *online* public administration services must meet completely new challenges: government operation must become transparent and accountable, the satisfaction of users as citizens should be increased, and the bureaucratic burdens on enterprises and taxpayers should be reduced, while at the same time, the universal availability of office services must be ensured.

Citizens of the European Union definitely require the *online* availability of eGovernment and other public services; 55% of those using e-public services in the Union spoke positively about them. At the same time, a survey carried out during the *eUser* project financed by the Union (eUser, 2005) noted that one third of users (33%) have met with some kind of obstacle at least once when wanting to use an eGovernment service. According to another interesting result of this survey, even though users are happy about the possibility of establishing *online* con-

tact and administration, they often feel that compared to personal or telephone administration this form offers them no tangible advantages. It is a general European experience that among citizens who do not use the Internet but would like to use eGovernment services, one out of three cannot do so because they do not have the necessary computer knowledge. Because of their lack of knowledge and experience, a significant percentage of citizens do not actually get to try to access eGovernment services, despite their emphatic needs. Accordingly, the further development of eGovernment depends on the implementation of the following tasks:

- Further modernisation of service-side processes.
- Exposing and eliminating factors that prevent the social diffusion and acceptance of online services.
- Demonstrating the economic and social usefulness of these development programmes and achieving public acknowledgement of this.

Advantages for bodies offering public administration services:

- Developing low-cost channels for communication with citizens and members or operators in the business world.
- Increasing efficiency, primarily by information-division.
- Increasing state revenue by the building in of "payment for services".

Advantages for the users of services:

- Savings regarding public administration costs.[7]

Advantages to the society:

- Services that can be used more rapidly (time-saving),
- non-stop availability (convenience, time-saving),
- better manageability of information (convenience, time-saving),
- opportunity for self-service (convenience, time-saving),
- better supply of information (increasing awareness and being well-informed),
- more efficient communication, with special regard to more isolated communities (convenience, time-saving).

Advantages deriving from supporting comprehensive government goals:

- Simplification of process in interactions between the administration and citizens,
- more transparent government,
- macro-economic advantages – a more efficient labour market, more efficient distribution systems, reduction of costs, introduction of new products to the market.

The possible disadvantages of eGovernment:

- The personal relationship between customers and administrators, which is considered to be important by some people, may be lost.
- It is sometimes difficult to find information. Web homepages should be well-designed and easy to follow.

[7] Savings are primarily the result of faster information flow, and the fact that the forms needed for administration are downloadable.

To sum up, we can say that the three important target groups below could profit from eGovernment services in different ways:

1. In the case of *citizens*, it is primarily in timesaving and access to a rising standard of services, but increased transparency is also important.
2. The advantages to *businesses* do not differ significantly from those of citizens, but since businesses are usually connected to public administration by more ties and administrative tasks, they have more to gain from eGovernment.
3. In the case of public services, the advantages can best be measured in time and cost savings – these can be achieved by information of higher quality, the elimination of unnecessary steps in the work process, the development of coordination between offices and the automation of services.

REVISION QUESTIONS

1. List the arguments for the exceptional re-evaluation of the role of eGovernment.
2. Into which two main areas of action can we divide eGovernment? What is their relationship to each other?
3. List and characterize the maturity levels of eGovernment services.
4. Which technologies can support the strengthening of deliberative democracy?
5. Which groups are not targeted by the 20 online public services recommended by the European Union?
6. What type of investigation should we favour regarding research into eGovernment?

BIBLIOGRAPHY

1. Key bibliography

Heeks, Richard (2006): *Understanding and Measuring eGovernment: International Benchmarking Studies* (Development Informatics Group, IDPM, University of Manchester, UK)

2. Optional bibliography

i2010 High Level Group (2006): i2010 Benchmarking Framework (http://ec.europa.eu/information_society/eeurope/i2010/docs/benchmarking/060220_i2010_Benchmarking_Framework_final_nov_2006.doc, accessed again 12 July 2007

Hutchinson, Peter – Osborne, David (2006): *The Price of Government: Getting the Results We Need in an Age of Permanent Fiscal Crisis.* Basic Books (USA, New York)

OECD (2007): *Towards Better Measurement of Government* (OECD Working Papers on Public Governance, 2007/1, OECD Publishing, http://www.oecd.org/dataoecd/11/61/38134037.pdf, accessed again 12 July 2007

Statistical Indicators Benchmarking the Information Society (SIBIS) (2003): *Benchmarking eGovernment in Europe and the US* (RAND Europe)

ELISA MANCINELLI

e-Inclusion in the Information Society

SOME RELEVANT DEFINITION

Before addressing the issue of **e-inclusion or digital inclusion,** it is important to go back to some general definitions **of social inclusion** (and social exclusion, being the reverse side of the medal).

There is a considerable body of research to demonstrate that **social exclusion** *is complex and multi-dimensional* (Bradshaw et al, 2004). The key inter-relating factors include low income; labour market exclusion (linked to ill-health, low educational attainment and lack of skills); access to education and learning opportunities; housing status; degree of social capital and neighbourhood status, linked to the reinforcement of 'cycles of poverty'. These factors tend to commonly occur across many western societies. In turn, standard measurements of exclusion and poverty suggest that the "poverty gap" is increasing rather than diminishing. However, although this pattern holds for a number of other countries within the EU and elsewhere, there is some evidence to suggest that some societies are less 'exclusion prone' than others (Justino and Litchfield, 2003).

One area that has been relatively neglected in research, and which could contribute to explaining this differentiation – and indeed to explaining why social exclusion remains so intransigent – centres on cognitive, cultural and discursive processes that shape how poverty and exclusion are socially constructed and how they relate to identity and 'learning'. From its early years, social science has explored linkages between social cohesion and social pathologies, tracing interactivities between social disintegration, crime, poverty, deviance and 'anomie' (Durkheim, 1951; Merton, 1968; Giddens, 1991).

A recurrent theme in this strand of social science is that cultures, communities and groups that develop strong and adaptive mechanisms to promote cohesion and solidarity are somehow more resistant to the forces of social dislocation and social exclusion, and hence more resilient in the face of social and economic pathologies. It is suggested that sustained and repetitive exposure to social and economic ills – as a result for example of poverty-induced ailments, "generated by despairing circumstances, insurmountable tasks, or lack of social support" (Elstad, 1998; Krieger, 2004; Kawachi and Berkman et al, 2000) – itself undermines social cohesion, saps the collective spirit and therefore ultimately increases the vulnerability of those exposed to social and economic pathologies.".

Thus some studies argue that environments characterised by highly developed levels of "social capital" and 'social cohesion' can improve population health by influencing norms

and strengthening the bonds of "civil society" (Kawachi and Berkman, 2000; Wilkinson, 1996; Lynch et al, 2000; Kunitz, 2001).

This perspective partly reflects the long-established concept that social exclusion *stems from the combination of multiple factors of* **deprivation** (Townsend, 1993; Bradshaw et al., 2003; Perry, 2004), pertaining to dimensions such as: economic distress, deficient schooling, inadequate housing, unemployment, etc., as explained in the following section.

SOCIAL EXCLUSION/SOCIAL INCLUSION

Social exclusion is subject to many and different attempts at definition. Many definitions focus on the "classification" of target groups excluded or at risk of exclusion made on the bases of factors of disadvantage that can, for example, be economical, physical, geographical, or linked to gender, age, etc.

While the concept of poverty refers to lack of resources, especially lack of income, the concept of social exclusion seems to point to the multidimensional nature of the process of exclusion, which amplifies its effects on individuals, groups within region or urban areas, or in society as a whole.

Seen in the wider sense, *the concept of social exclusion is related to the relative position that an individual or a group has in the whole context of the society.* Exclusion may be due to being part of an ethnic or religious minority, or to being resident in a geographically disadvantaged area etc. In any case, there is surely a link between poverty and social exclusion but poverty is not the only factor of social exclusion.

This conceptual difference is particularly evident in EU political documents and programmes. A key distinction between poverty and social exclusion lies in their single and multiple dimensions. Multidimensional social exclusion is the outcome of more complex processes than the mere poverty.

Exclusion can perhaps be understood more clearly from the point of view of a social structure where the following sub-systems are present:

- politics (democratic distribution system);
- economic system (labour market and instruments of economic integration);
- social system (welfare state supporting services and social integration);
- community and family systems.

Considering social exclusion as a dynamic concept, in which different importantvarious factors contribute to deprivation, it becomes relevant to take into account a range of "indices of deprivation" (DETR, 2000), as follows:

- Employment Deprivation
- Income Deprivation
- Health Deprivation and Disability
- Education, Skills and Training Deprivation
- Housing Deprivation
- Geographical Access to Services
- Exposure to Crime
- Physical Environment

Social exclusion goes beyond issues of unemployment and access to the labour market. It is evidenced by several types of deprivation and barriers, which alone or together prevent the full participation in areas such as education, health, environment, housing, culture, access to rights or family support, as well as training and job opportunities.

Discrimination and xenophobia can exacerbate social exclusion, in particular for immigrants. Social exclusion also raises particular questions in relation to social protection policies – most notably the safety net schemes and their related measures. It calls for attention to education, and training policies, taking in particular account of the view that life long learning is vital if people are to be empowered to act as full members of the knowledge and information society.

Access to public and private services and the quality of these services, including care services, are also major issues. Combatting school failure, ensuring access to the technology of the Information Society, and developing the skills and competence needed to take advantage of it, are also essential to ensure that the information age does not actually create new divisions in society, but rather promotes inclusion and cohesion (European Commission, 2000b).

Such an approach to social inclusion implies the creation of synergetic relationships and collaborations between different actors in local government and services, public administration and social networks so as to adopt a "system approach".

Following this approach, social inclusion can be characterised by means of some institutional definitions. According to the definition of the Centre for Economic and Social Inclusion (2002)[1]:

> "Social inclusion is the process by which efforts are made to ensure that everyone, regardless of their experiences and circumstances, can achieve their potential in life. To achieve inclusion, income and employment are necessary but not sufficient. An inclusive society is also characterised by a striving for reduced inequality, a balance between individuals' rights and duties and increased social cohesion."

Another definition developed by the European Working Group on Empowering the Excluded (1999) explains social inclusion as follows:

> "The development of capacity and opportunity to play a full role, not only in economic terms, but also in social, psychological and political terms."

THE DIGITAL DIVIDE IN THE INFORMATION SOCIETY

Various features if the Information Society entail new access and exclusion issues. There has always been a gap between those people and communities who can make effective use of information and communications technology (ICT) and those who cannot. Now, more than ever, unequal adoption of and access opportunities to ICT exclude many from benefiting from the advantages related to the introduction of technologies in many fields of social life.

[1] The *Centre for Economic & Social Inclusion* is an independent, not-for-profit organisation working with the British Government, the voluntary sector, business and trade unions. More information at: http://www.cesi.org.uk/.

The term **digital divide** refers to the gap between those who can effectively use new ICT tools, such as the Internet, and those who cannot. Whilst a consensus does not exist on the extent of the divide (and whether the divide is growing or narrowing), researchers are nearly unanimous in acknowledging that some sort of divide exists at this point in time.[2]

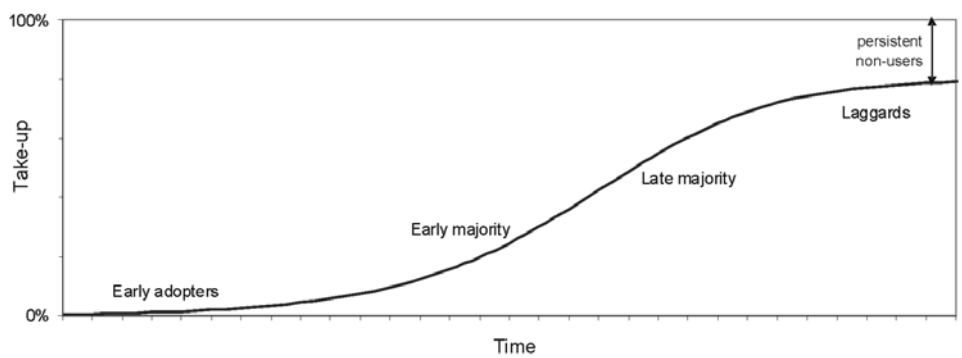
In fact *there is not just one digital divide but multiple divides which relate to a variety of factors* such as: gender; age; "ethnic clustering"; uncertainty of living/financial conditions; work insecurity, and social insecurity.

In the light of this, social exclusion principles and policies need to be rethought to take into account the fact that the digital divide is basically about social access to digital technologies. This goes beyond the idea of "access to the technical kit" and considers the social relations around the uses of ICT and the socio-technical aspects of the emergent Information Society. Instead it is about lifestyle choice; identity creation; changes in social structure and relationships; the emergence of new working methods; changes in the economies of education and training; the creation of new communities of learners/citizens according to a societal learning paradigm.

1. A theoretical approach to understand e-inclusion policies

The stage of development of e-inclusion policies can be investigated and understood using Molnar's analytical model (Molnar, 2003), based on the concept that the **diffusion of innovation** typically follows an **S-curve of adoption:**

1. Figure. Diffusion of innovations

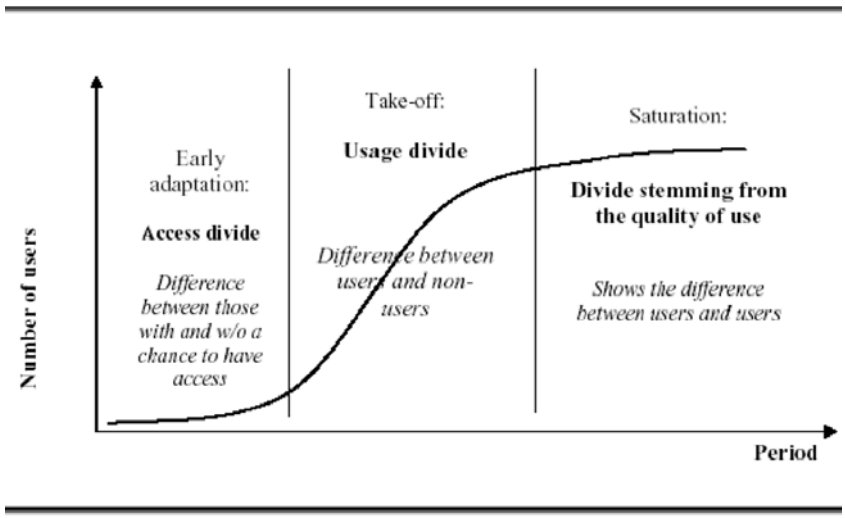


Source: Molnar, 2003

Molnar applies and adapts this conceptualisation to the specific phenomenon of ICT adoption and diffusion, also considering a range of social, cultural and economic factors – for example income – that influence the model:

[2] Definition taken from the web site of the Digital Divide Network, accessible at the following URL: http://www.digitaldividenetwork.org

2. Figure. Diffusion model of innovation regarding using of ICT means



Source: Molnar, 2003

„In the take-off phase, a minority of some early adopters take up the new technology. Growth in user figures is rather low due to high prices, insecurity about functionality and standards and poor diffusion of knowledge about the innovation. Once prices fall and these insecurities vanish, take-up begins to gain velocity and the large majority of early users and late users become involved. Once a saturation level is approaching, only the smaller group of late adopters or laggards is still left uninvolved and growth rates decline again." (Empirica, 2006: 13–14).

Such a theoretical model assumes that ICT diffusion patterns are shaped by a combination of three variables: the degree of penetration of the technological innovation(s); the rate of growth, and the actual properties of the technologies themselves. The interaction of these three variables leads to three types of **"diffusion state":**

- **Saturation –** where penetration is practically complete and growth is stagnant
- **Plateau** – where penetration is very high but not complete and growth is low or oscillating
- **Dynamic** – where penetration is lower but increasing and growth is very high

Molnar suggests that in the case of old technologies, the stage of saturation is observable. This means that growth is at a standstill, while for example plateau cases like cable television and video cassette recorders (VCR), a low or oscillating growth rate can be perceived presently. It would be logical to assume that ICTs will reflect this dynamic pattern. More importantly, the model suggests that the differential operation of these diffusion and adoption factors, in terms of the take up and adoption of ICT technologies, will shape the process, and the features of different types of "digital divide".

Furthermore, the model suggests that three broad types of "digital divide" can be identified (Molnar, 2003), each associated with these different diffusion phases:

1. Table. Main types of digital divide

Adaptation stage	The digital divide		
	Type	**Term**	**Description**
Early adaptation	Access divide	Early digital divide	Describes the difference between those with and without access
Take-off	Usage divide	Primary digital divide	Describes the difference between users and non-users
Saturation	Divide stemming from the quality of use	Secondary digital divide	Describes the difference between users and users

Source: Molnar, 2003

The three facets of digital divide are defined as:

- *Access divide* or *early digital divide:* it considers the gap between those with and those without access.
- *Usage divide* or *"primary digital divide"*: it concentrates on those who have access but are non-users.
- *"Quality of use" divide* or *secondary digital divide*: it focuses on differentials in participation rates of those people who have access and are users.

2. E-inclusion and the European Union

E-inclusion has become a 'must' in the policy initiatives and actions carried out at macro level by EU Member States, and at meso and micro level by all social actors (collective and individual, public and private). E-inclusion is the information society dimension of the "Social Inclusion Process" which the EU Member States launched at the European Council in Nice (European Commission, 2000b) in their strategy to fight exclusion.

The eEurope Advisory Group has defined e-inclusion as follows (Kaplan, 2005):

> "e-Inclusion refers to the effective participation of individuals and communities in all dimensions of the knowledge-based society and economy through their access to ICT. (…) Further, e-Inclusion refers to the degree to which ICTs contribute to equalising and promoting participation in society at all levels. (…) The digital divide measures the gap between those who are empowered to substantially participate in an information and knowledge-based society, and those who are not."

Furthermore it stresses that *the scope of e-inclusion analysis must consider both individuals and communities.* Also e-Inclusion shall not be reduced to e-Adoption, which would only look at levels of ICT at large and miss the social impact of relative differences in ICT use between various socio-economic groups and individuals.

As the Information Society advances, it becomes ever more important to ensure that disadvantaged people are not left behind. Data collected in the framework of a Europe-wide research initiative (Gallie and Paugam, 2002) also show that huge gaps in ICT access and

literacy persist, and that digital exclusion is more and more felt as a real barrier for people's lives. The emerging risks of the digital divide underline the urgency of preventative actions for specific target groups mobilising both public and private actors.

In this respect, the definition of the so-called "Lisbon goals" (March 2000), focusing on economic competitiveness; social justice; an inclusive society and the elaboration of the related policies have set the pace for the balanced and sustainable development of e-inclusion actions.

The following table summarises the policy development process at EU level:

2. Table. Policy development process at EU level

Policy	Policy function	Vision of EU policy	e-inclusion focus
eEurope 2002, eEurope 2005, i2010	„Access"	Providing access and ensuring availability of broadband access and information infrastructure through which e-Inclusion within Information. Society is possible.	Inclusion as a matter of preventing exclusion as well as an opportunity to use Internet resources.
eEurope 2002, eEurope 2005, i2010	„Accessibility"	Ensuring socio-technical accessibility for highly segmented target groups with different means.	Inclusion as overcoming of functional or social challenges of particular "target groups".
(eEurope 2002), eEurope 2005, i2010	„Development of services"	Ensuring accessibility and development of e-services in several sectors.	Inclusion as overcoming of functional or social challenges of particular "target groups".
eEurope 2005, i2010	„Building capacities for individuals"	Providing population or segments with adequate skills to utilize ICT-based services through "surviving" or "participating" in Information Society is possible.	Inclusion as a matter of having basic skills.
i2010	„Human and Social Capital"	Supports different types of peer-networks as well as bottom-up approaches and learning environments for human and social capital promotion.	Inclusion as contextual setting socio-cultural issues and their balance.
i2010	„Citizen Participation"	Creating interesting content and enabling citizens to participate in every issues they are interested in.	Inclusion as a matter of motivation and active empowerment.

Source: European Commission, 2007

Furthermore, the National Action Plans against poverty and social exclusion (NAPs/inclusion) were updated and presented by all Member States in July 2003 in response to the common objectives to fight poverty and social exclusion, revised in December 2002.

Each Member State presented in the NAP its priorities and efforts for the following two years (mid-2003–mid-2005), focusing on a set of priority areas identified through a concerted policy process. Eight core challenges stand out from the NAPs/inclusion (2001):

1. developing an inclusive labour market and promoting employment as a right and opportunity for all;
2. guaranteeing an adequate income and resources to live in human dignity;
3. tackling educational disadvantage (preventing young people from dropping out of school, developing and extending lifelong learning so that there are customised education and training opportunities accessible to vulnerable groups, enhancing access to basic skills provision or tackling illiteracy);
4. preserving family solidarity and protecting the rights of children;
5. ensuring good accommodation for all;
6. guaranteeing equal access to quality services (health, transport, social care, etc.);
7. improving the delivery of social services and overcoming the fragmentation and compartmentalisation of policy making and delivery;
8. regenerating areas of multiple deprivation.

In 2001 when the European Council of Nice endorsed the proposal of a strengthened coordination process based on common objectives, National Action Plans and commonly agreed indicators, the fight against social exclusion ceased to be an exclusively national concern.

3. E-inclusion as an empowering factor for European citizens[3]

E-inclusion *is considered as a key factor for Europe's future for a number of reasons.* In economic terms, the EU's competitiveness will be affected by factors like the market penetration of ICTs; the development of a comprehensive e-skills base to enable European industry to evolve, and the creation of new markets for e-services. In turn, social cohesion and a dynamic, multi-cultural and inclusive society will be supported by active citizenship and a strong participation culture. The policy initiatives designed to promote active citizenship and participation – based on e-government and e-democracy – assume a high level of ICT use by citizens.

However, statistics and qualitative studies also show that e-inclusion is a problem for a significant number of European citizens. For instance, the 2005 Community Survey on ICT usage shows that more than one third of European citizens do not have access to a computer and 37% between the ages of 16 to 74 have no computer skills whatsoever. Access and ability vary from country to country, with highest levels of e-inclusion in Northern Europe,

[3] This section is based on the study: Status of e-inclusion, measurement, analysis and approaches for improvement (European Commission, 2007).

particularly Scandinavia, and lowest levels in southern Europe and new member states. E-inclusion also varies according to variables like age and gender, and there are particular groups in society who are vulnerable to e-exclusion. This is reflected in the targeting strategies adopted by e-inclusion policies and actions which focus particularly on young people; older people; women; people with disabilities.

Research suggests that actively promoting e-inclusion policies, initiatives and practices could have positive impacts at different levels. For *individuals*, lack of e-skills and low digital literacy can affect life chances including educational and employment opportunities. Since an estimated 60% of existing and 90% of new jobs require ICT skills (Department for Education and Skills, 2002), people who are ICT-literate in principle stand a better chance in the job market. In turn, job vacancies are increasingly advertised on the Internet. E-inclusion initiatives based on exploiting these trends, such as the Employment Café[4], are working to promote the development of e-skills.

At the *community* level, e-inclusion policy and initiatives aim to impact in these key areas: making government services more effective; reducing isolation and social alienation; promoting community harmony and reducing tensions. A number of government services – for example driving test bookings – are now enabled on-line, although the level of service varies significantly between different EU member states. Attention is now being paid to ways in which integrated e-inclusion services, bridging a range of different government agencies, can promote better quality of life for communities. Similarly, there is some evidence that the availability of on-line infrastructure, coupled with investment in supporting the development of the e-skills necessary to use it, encourages greater participation in local democracy.

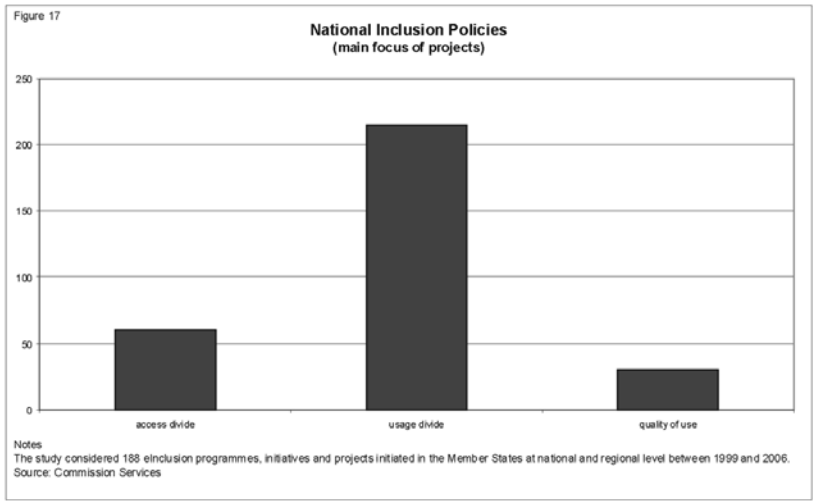
E-inclusion policies also affect *business and industry.* It is argued that the complex nature of the challenge to enable a digital EU can only be addressed through partnerships between government, industry and the third sector. An interesting feature of recent trends has been the increasing importance of corporate social responsibility in shaping industry's involvement in e-inclusion.

E-INCLUSION POLICIES IN THE EUROPEAN UNION

The model developed by Molnar finds interesting applications in reality. Considering the policies for e-inclusion that EU Member States have been developing in the past few years (European Commission, 2007), it emerges that EU countries are placing emphasis mainly on fighting the usage divide.

However, the review also showed that activities addressing the access divide are still very much a feature in national policies though their relative importance differs greatly between countries. In general, the more sophisticated a national ICT infrastructure and the greater the 'hardware saturation", the more likely a country is to tailor access activities to exclusion factors and to explore the viability of extending new technological modes of access.

[4] http://www.employment-cafe.co.uk/home/index.asp



Source: European Commission, 2007: 34

Based on the study carried out by Empirica (2006), it can be affirmed that:

"By signing the Riga Ministerial Declaration in June 2006, 34 European countries now have expressed their dedication to carry on furthering an inclusive and unrestrictive Information Society which in conclusion abets social and economic inclusion."

With its statements, the Ministerial Riga Declaration provides a mixture of "policy objectives" and "policy targets". In sum, it sets out the following specific targets:

1. to halve the gap in internet usage by 2010 for groups at risk, such as older people, people with disabilities, and unemployed persons,
2. to increase broadband coverage (i.e. the availability of broadband infrastructure) in Europe to at least 90% of the EU population by 2010,
3. to ensure that all public websites are accessible by 2010,
4. by 2008, to put in place actions in the field of digital literacy and skills so as halve gaps for groups at risk of exclusion by 2010,
5. by 2007, make recommendations on accessibility standards and common approaches, which could become mandatory in public procurement by 2010, and
6. assess the necessity for legislative measures in the field of e-Accessibility, and take account of accessibility requirements in the review of the electronic communications regulatory framework beginning in June 2006." (Empirica, 2006: 17–18).

The European Union has committed itself to the configuration of a receptive information society and has assigned those tasks as well which are necessary to achieve these goals – now it is the member states' term to realize this policy.

SUMMARY

To date theory, research, policy and practice in education, and in social inclusion, have tended to follow "parallel lines". Whilst it has long been recognised that education (or the lack of it) is inextricably linked to the causes and effects of social exclusion, *little systematic*

work has been done to develop a "joined up" approach to learning and inclusion, and to integrate these domains with other related policy agendas such as citizenship, identity and immigration and community regeneration. This is particularly relevant in relation to the adoption and application of new technologies in education – particularly aimed at dis- advantaged groups – since there is increasing evidence that new technologies may be working to increase rather than reduce inequalities, and promote rather than eradicate the so-called "digital divide".

Against this background, a fundamental task to be taken on and brought forward is to explore how far and in what respects social exclusion reflects a form of "inheritance" – one that is mediated through and exacerbated by a particular dominant learning paradigm. This exploration is to be considered within the context of another hypothesis – that education is currently in a state of crisis and that the current "state of the art" in education theory, policy and practice can do little to promote social inclusion and cohesion unless it begins to understand, develop and apply learning paradigms that are based not on 'human capital' principles but on models around "societal learning".

Another set of issues revolves around the penetration of new technologies into most forms of social relations and social discourses – and more importantly the role of new technologies in shaping new forms of social relations. These issues and the dynamics that underpin them are rapidly evolving and are highly contested. To polarise and (over)simplify the debates, one perspective maintains that the process of globalisation is creating societies in which people's level of access to information and knowledge is becoming a key factor in determining their access to economic, social and political power. Those without access to "official" knowledge and information are increasingly excluded from significant participation in society. Since the excluded are less likely to be able to access new technologies, then it is highly likely that they will represent the majority of the emerging "digital underclass".

The counter-position to this perspective is that *new technologies represent a huge opportunity to address social exclusion* through for example providing access for the excluded and "hard to reach" to training and skills development opportunities Perhaps more significantly, there is an argument that new technologies provide opportunities for the development of multiple identities, and the constant re-definition and re-invention of "self" (Giddens, 1991, 1994, 2000). This has important implications for developing new ways of addressing persistent and inter-generational exclusion, since it implies that people can escape "poverty inheritance" with the help of new technologies.

REVISION QUESTIONS

1. How can the relationship between social inclusion and e-inclusion be defined?
2. What does the term "factors of multiple deprivation" mean?
3. How can "the digital divide" be defined?
4. What does "early digital divide" refer to?
5. What does "primary digital divide" refer to?
6. What does "secondary digital divide" refer to?
7. What is the European Union strategy to fight the digital divide and promote e-inclusion?

BIBLIOGRAPHY

1. Key bibliography

Giddens, A. (2000): *Runaway World: how Globalisation is reshaping our lives* (Routledge, London)
Molnar, Sz. (2003): *The Explanation Frame of the Digital Divide, Proceedings of the Summer School, Risks and Challenges of the Network Society,* 4–8 August 2003 (Karlstad University, Sweden)

2. Optional bibliography

European Commission (2007): i2010 – Annual Information Society Report 2007. Commission Staff Working Document: Accompanying document to the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM(2007) 146 final
European Commission (2000): Communication: "Building an Inclusive Europe", Brussels, 1.3.2000, COM(2000) 79 final (available from
http://europa.eu.int/eur-lex/en/com/cnc/2000/com2000_0079en02.pdf,
Berkman L. – Kawachi I. (eds) (2000): Social epidemiology, Oxford University Press, Oxford)

ÁRPÁD RAB

Digital culture – Digitalised culture and culture created on a digital platform

INTRODUCTION

The word ***culture*** originates from the Latin verb *colere,* which means "to cultivate". It was first used by Cato[1] to refer to the cultivation of land (vineyards, gardens, etc.). Thus, cultura agri meant looking after, nurturing, changing and improving the "raw" nature that surrounded man. It was a statement made by Cicero[2] in his work *Tusculanae Disputationes* that brought about a significant change in the meaning of the word, which was the first important step towards the formation of its present usage: *"cultura animi ... philosophia est"* (Kondor, 2001), i.e. philosophy is the cultivation of the soul. Man is a biological and social being at the same time. It is culture – instruments, tools, clothing, ornaments, customs, institutions, beliefs, rites, games, works of art, etc, and even language – which enable man to become a social being. Leslie A. White, an acclaimed cultural anthropologist, defined man as *one possessing the ability to create symbols and thus culture* (White, 1942). Culture has numerous definitions.[3] This chapter will look at culture as a survival strategy and as a sum of all non-inherited information.[4] The holistic approach to culture has recently been summed up in anthropological scholarly literature by Clifford Geertz (1973).

It can be seen from the above that culture is a highly complex concept undergoing changes era by era and understood differently by social groups. *Digital culture can be regarded as a growing part of "traditional" culture which cannot be interpreted or even exist on its own.* Digital culture is part of culture, and can be seen as a sum of all cultural objects (and the meanings conveyed by them) that exist on a digital platform, whether they have been *created digitally* or *digitalised.* Digital culture is a complex area including the following major sub-areas:

- The technical equipment necessary to access digital culture; their development, changes and the new opportunities they open up, etc. This area includes all kinds of equipment through which the elements and phenomena of digital culture can be accessed (for example, computers, mobile phones, PDA, digital cameras, modern televisions, etc.).

[1] 234–149 BC

[2] 106–43 BC

[3] Alfred Kroeber and Clyde Kluckhohn collected 160 definitions of culture in 1952, and since then this number of definitions has multiplied.

[4] For some definitions of culture accessible *online* see:
http://www.tamu.edu/classes/cosc/choudhury/culture.html

- The capability of value creation through the ability to use of digital culture, i.e. information literacy. Just as the overwhelming majority of society was excluded from certain types of dialogue, rights and services in the early part of the modern age because they did not read and know how to use Latin, so the inability to create value through the use of digital culture can exclude a great part of the world's population from the information society.
- Digitalisation.
- Cultural elements created digitally or on a digital platform.

In a simplified way, digital culture can have two sources: the *digitalisation* of already existing cultural objects, and the *digital creation* of cultural elements. Both these areas are extremely multifarious and exciting, and thanks to today's revolution in regard to *online* content and users, digital creation has attained a predominant role with digitalisation – which seemed to be a key task just years ago – having faded into the background.

This chapter, devoted to digital culture, will begin with the explanation of the following terms: *information literacy,* i.e. the ability to access and understand information, *digital cultural heritage,* i.e. saving and preserving in digital form those cultural achievements that have been deemed important so far. Finally *digital culture* will be explored. If looked at in the timeline of human culture, the computer only appeared moments ago. People's participation *en masse* in a digital environment, started by the mass proliferation of computers and digital equipments (e.g. digital cameras) and the growth of the Internet has literally been going on for only a few years. In 2006 one sixth of the world's population had Internet access and almost every second person used a mobile phone, even though the Internet only became accessible in the first half of the 1990s, which means that the digital revolution (or the revolution of devices) changed the world in the course of merely 15-20 years.

INFORMATION LITERACY

1. A brief history of information literacy

The term information literacy emerged as a result of the information technology revolution of the 1970s. In the past thirty years the usage of the term has significantly expanded, with new layers of meaning incorporated, but at the same time it has also become somewhat narrowed down (it is increasingly applied to computer and Internet usage). It is important to understand that information literacy is not the ability to handle certain devices and equipment but *the ability to access and use information,* which is going to become indispensable in the future for all citizens of the information society.

Most people identify information literacy with computer skills and the ability to deal with information gained from the Internet (i.e. with Internet literacy). The schools of anthropology, social science and philosophy exploring the changes in the basic structure of literacy and in a wider context written and verbal communication, did not focus their attention on information literacy as a narrative. In contrast, the Toronto School (Havelock and Goody-Watt as well as their followers and critics) created enough literature to fill an entire library; their key term "secondary verbality" focuses exactly on the impact of the recently changed electronic media environment on culture.

One of the earliest appearances of the expression "information literacy" dates back to around 1974 (Zurkowski, 1974), when the term was closely attached to educational reform (primarily that in the United States) and at the very outset it was related to the efficient use of information. In 1976 Buchinal defined information literacy as a *set of skills* which he divided into three levels: 1. abilities that help to find and use information; 2. using information in problem-solving and decision-making; 3. searching for and making use of information efficiently. *Those who created the later concepts of information literacy extended and refined this division according to their own insights.* In 1976 Owens (Behrens, 1994; Bawden, 2001) linked information literacy with democracy to underline the relationship between involvement in civic life and information literacy, the latter being seen as the ability of individuals to access and process news. It was Taylor who introduced the term information literacy into the scholarly literature of library science in 1979 in the columns of *Library Journal* (Taylor, 1979; Behrens, 1994; Spitzer et al, 1998). In the seventies the term was associated with services provided for citizens and it is clear that the "information explosion" that took place around that time greatly contributed to the emergence of the expression (Behrens, 1994; Spitzer et al, 1998). *In the eighties the term was given increasing emphasis in higher education in the United States.* Several essential works were published in this period[5], which shared one characteristic, namely that information literacy was not defined as a set of abilities but rather as a tool or a method for learning.

Several new interpretations of information literacy emerged in addition to the scholarly literature of library science and the professional circles involved in educational reform. Some of these were the information skills model and the model of the information search process, as well as models focussing on perception or the behaviourist notions of extracting information. It can be stated that *by the late eighties the concept of information literacy became mature and widely used*.[6]

2. The concept and models of information literacy

The concept of information literacy is closely linked to network literacy, Internet literacy, multimedia literacy, and hypertext literacy. The reason why the *umbrella term e-literacy* did not become used is because it is pronounced the same as the word *illiteracy*. The expression

[5] Ed*ucating Students to Think: the Role of the School Library Media Program* was published in 1986 and Kulthau's *Information Skills for an Information Society: A Review of Research* in 1987. The division into six in *The Big Six Skills Approach,* published in 1998, is regarded to this day as the authoritative approach taken to information literacy (also Eisenberg, M. & Berkowitz, L. 1990).

[6] It should be noted that the first personal computer came out in 1981, so the *development of the concept of information literacy predated the mass proliferation of PCs*. (The first home computer came out in around 1975 since it was in this year that a small, inexpensive computer for home use was launched on the market. It was called Altair 8800 and looked more like a toy. It was bought by engineers and people who dealt with electronic devices as a hobby.) IBM's PC was launched on the market in 1981. It soon became a worldwide success, and in comparison, its predecessors could be regarded as being more like experiments.

"Internet literacy" has been used informally by many since 1995 but it can rarely be found in scholarly literature. "Hypertext literacy" refers to the ability to gain knowledge accessible from hypertexts (mainly html documents). From the 1990s "digital literacy" has been used to denote the ability to read and understand hypertext and multimedia messages (containing text, image and sound).

Thus, the improvement of information literacy does not refer to the ability to use technical equipment but rather to the development of a conscious method or way of thinking through which one can achieve one's purpose. In other words, information literacy is the recognition of what information is missing, the search to find it, the actual finding it and finally processing the information found; therefore, the improvement of information literacy obviously entails the development of critical thinking.

Andretta grouped the skills necessary for information literacy according to three models (2005). The *behaviourist model* is based on behaviour that can be observed. It is criticised by many because it measures separate (partial) skills, such as the level of competence in using a browser, and the efficient use of search programmes, etc. *Constructivist models* place emphasis on critical thinking and independent learning. They are based on mental models and are related to the approach of "let's learn how to learn". The *relation model* complements the constructivist approach by emphasising the development of personal traits that give priority to the critical approach to using information.

Information literacy is the ability to access information and use it to create value and it can be said that *a person possessing information literacy* is one that recognises when he needs information. A person *possesses* information literacy if he has learnt how to learn.

3. Levels of information literacy and related skills

It can be seen that information literacy requires, or demands, several skills from the conscious citizens of the digital world. If the following skills are considered, it is easy to see how different people today are from the average citizen who lived in the early period of the modern age. These skills have never been expected of *all* people in any other previous period of history having been mainly in the domain of the intellectual elite. However, in *today's world, defined by the availability or otherwise of information, its value, genuineness and speed of flow,* these skills have become important for everyone. Without them *individuals will be unable to assert their rights or exploit any opportunities* even in their everyday lives.

The following table shows a summary of information literacy skills.

1. Table. Information literacy skills

Defining tasks, identifying missing information	Defining tasks, identifying the information necessary to solve these tasks and understanding why that particular information is necessary and how important it is. This skill involves the formulation of the question of why the information needs to be obtained. The information being searched for can be accessed on more than one platform (in print, digitally, on other data carriers or on television) and it might even be obtainable from a friend. It must be decided how energy-intensive the acquisition of the information is and whether this is proportionate to the importance of the information.
Strategy for finding information	Available sources must be identified, where they are located, as well as how and when they can be accessed. This skill involves the ability to use various sources of information, i.e. the ability to decide when information should be searched for in printed materials and when they are more easily found in *online* databases.
Using information	Using information involves the skill to look for information efficiently and in the appropriate sources. The user must be able to recognise the information he has been searching for and he must know when the search can or should be ended. It is important that the user be able to assess the value (credibility, accuracy, etc.) of the information he has found. A critical assessment of information can prevent the user from going off track during his search and to ending up finding the wrong information.
Synthesising	This is the level of analysing the information obtained and working with it. Besides knowing how to analyse the information, the user must arrive at new knowledge and new understanding. He must be able to present the search results, which, on a practical level, mostly means the understanding of the information found, its comparison, combination, annotation and conscious use.
Evaluation	This is the highest-level skill, including the ability to store the obtained information and the processed knowledge as well as to ensure their retreivability and later use.

Source: Eisenberg, M. & Berkowitz, L., 1990

The above table sums up the levels and skills of information literacy. These levels are logically built on one another and entail the *skill to handle information and knowledge of how to learn*. Acquiring these information literacy skills requires a wide range of technical skills (e.g. knowing how to use library catalogues when looking for information or the skill to search *online* databases) at each level; however, the means should not be mistaken for the end, i.e. the skill to use various tools is not the same as that of processing information.

The following sections will be devoted to the digitalisation of the cultural heritage. The first sources of digital culture were created only in this way and the majority of digital objects are still created through digitalisation.

THE DIGITALISATION OF THE CULTURAL HERITAGE AND ITS ROLE IN THE INFORMATION SOCIETY OF THE EUROPEAN UNION

1. Culture, heritage, digitalisation

Humanity has always sought to show its treasures and preserve them for posterity. This is one of the most important tasks of culture. Of course, the preserved elements of culture not

only fulfil an aesthetic function but also have practical value in the area of education for example, as well as theoretical and ideological value in other respects. Digitalised cultural heritage must fulfil the same role. *However, due to the technical nature of digital preservation, some functions might be lost, distorted or weakened.* Distortions due to technology not only result from problems arising during the digitalisation process but also from other technical imperfections when accessing the digitalised material. Distortions might also be a result of human errors (inadequate preparatory work, inconsistent or uneven digitalisation work). In this respect, the responsibility that needs to be assumed by the profession and the difficulties involved considerably outweigh technical challenges. *The technological level of software and hardware is far more advanced than the theoretical foundation.*

The demand for systematising, classifying and using humankind's preserved treasures is keeping pace with the development of science. It is well known that every civilisation has striven to preserve its cultural achievements. *So how can digitalisation be more than inscribing in stone, for instance,* if both of these preservation techniques are accepted as being efficient? Of course there is more than just a technical difference between these two methods: more important is the different *levels of interactivity. Digitalised material assumes genuine value if "intelligent" operations can be executed on a text.* The digitalisation of the cultural heritage poses practical, theoretical, technical and scientific problems alike. It requires the co-operation of at least two groups ("technicians" and scientists) as well as mediation carried out by a specially trained group with members who are able to do the job of the first two groups; for example, librarian-information science experts and information scientist-museologists. The partners in co-operation must be able to engage in a dialogue during which it is clearly understood what needs to be digitalised and how, and what can be carried out efficiently as far as the time and costs are concerned. Furthermore, the parties must agree on the acceptable size of value loss during digitalisation work.

There are a great many questions in regard to digitalising the cultural heritage. *What kind of culture should be digitalised?* According to the traditional ethnographical approach, culture is divided into folk, or popular, and elite culture. Culture should also be understood in a temporal context. Which culture should be digitalised? What is the aim of digitalisation: is it to record the present for the future or is it to protect humankind's cultural treasures from sinking into oblivion? Is the preservation of a given geographical region's past the task of the people living there? *Europe's history is extremely rich and diverse* and thinking about European culture immediately raises the possibility of co-operation extending to many countries. All these questions seem to have a simple answer: yes, everything should be digitalised since all elements of culture are important. However, *it is impossible to carry out this formidable task, and perhaps it would not make much sense to do so,* even though it has never, since the beginning of human civilisation, seemed as easy as it is now.

The digitalisation of the cultural heritage must be carried out selectively. In order to provide a sound foundation for this, value research projects must be conducted on the entire cultural heritage (including today's culture). Such research can also contribute to feasibility studies related to globalisation.

2. Table. The selection process of digitalising the cultural heritage

The concepts of culture and cultural heritage are too vague and broad; therefore, selection is necessary.
↓ The first selection is made by the state and the scientific sector.
↓ The second selection is made when the bottlenecks (technology, expertise, funds, quality of sources, legal framework) are identified.
↓ The third selection is the actual publication – for laymen who are interested (e.g. tourists), for students and for expert researchers.
Accessible and usable digital cultural value can be created only after the narrowing down of the initially broad concept.

Digital archives are based on collections of objects but during digitalisation the result becomes distant from its source. Compared with traditional archives, the value of objects is approached differently in digital archives, creating a great amount of added value. While the task of traditional museums is to collect, display and preserve actual objects that represent cultural values or other information, digital archives collect and store only *the information conveyed* by the objects. With the exception of those media that are built on information flow taking place on a digital platform, digital databases cannot exist without traditional collections.

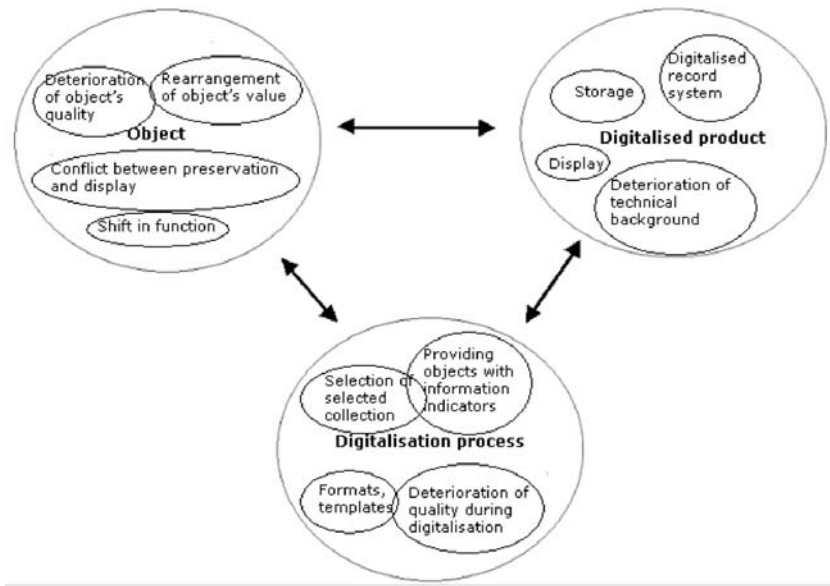
Digitalisation is a process during which works (texts, /moving/ images, and sounds) originally published non-digitally are converted into an encoded form readable by computers. When texts are digitalised each character (letter, punctuation mark, etc.) is given a separate code; this is often complemented by commands about how the text is to be displayed. During the digitalisation of images the light sensor unit of a page reader device (scanner) scans each dot of the image to be digitalised. The computer stores the information which has been collected about every tiny dot and transmitted through the scanner, and reconstructs the image based on this information when it is retrieved from memory. Printed text pages can also be digitalised as images; however, in this case the text itself cannot be retrieved because the characters are not made readable for the computer. When sound is digitalised, a special tool (e.g. a sound card) is used to convert analogue signals into numbers. When the sound recording is played, the digitally stored sound data, stored on the computer in an encoded form, is converted back into analogue signals.

2. Objects, digitalised objects and digitalisation

Objects, digitalised objects and digitalisation together enable the creation of a new, higher level of quality. It would be a grave mistake to assume, however, that digital collections make traditional collections redundant. The two kinds of archives or museums are not interchangeable and one cannot substitute the other. The role played by traditional museums has nevertheless changed: they have been mostly relieved of the burdens and "harmful effects" that accompany publication and display and their most important tasks remain collection, storage and the digitalisation of their material. *It is important not to assume a liberal technocratic evolutionary approach and interpret this change as a definitely one-way process of development from traditional museums to virtual archives.*

The situation can be better *illustrated with the co-ordination of three elements* which exist and will continue to exist complementing each other, with certain changes in their functions.

1. Figure. Problem map of object, digitalised product, and information conveyed



Source: Rab, 2005

The main problems relating to the given sets are indicated in the figure. The section below contains additional comments on each set.

First set: objects

There are major tensions between the preservation and display of objects in traditional museums: the display, the presentation (even if it is for only a select few) inevitably includes the risk of damage and therefore the preservation of displayed objects incurs significant extra costs. In fact, the majority of objects preserved in collections cannot be displayed, and it is no exaggeration to say that the public does not have access to about 90% of most collections. There are often many other reasons for this: not all objects meet the requirements of display, e.g. they are not documented properly or are not of adequate quality, etc. Displaying digitalised collections electronically resolves this conflict since it is not the physical objects but their digitalised form, i.e. the information they convey, that is presented. Objects of digitalised collections are not damaged by being displayed and viewed. In addition, the objects in museums will have a different function: the most important thing will be the value conveyed by the object and not the physical object itself.

Second set: the digitalisation process

Practically speaking, digitalisation is the re-selection of an already selected reality in a way that is affected by technical and cost-effectiveness parameters. When we speak about digitalisation, we come up against a number of questions: what is culture, what is heritage, what materials should be preserved and used digitally? From a functional point of view, culture can be seen as the sum of all non-genetically inherited information, as well as the survival strategy of smaller or bigger and organised or less organised groups of people. Of course this definition is too broad to work with. That is why digitalisation must be preceded by the previously outlined cultural selection process.

Third set: digitalised products

Archives of digital products are not only suitable for salvaging information; their real value is manifested in their interactive, *online* use. The "realism" of the hardware and software systems carrying information is important from a practical point of view but it is unimportant on a theoretical level.

3. Challenges and impacts of digitalisation – the European Union

Currently, the libraries of the European Union hold more than 2.5 billion different volumes and periodicals. Due to the deterioration of the technical environment and its obsolescence, tens of thousands of hours' material is lost every year from the oldest collections of the European audiovisual archives. The only way to repair this loss is through (re)digitalisation. 70% of the material is in danger because the data media are perishable, vulnerable or become outdated: many of the objects are either original or are in analogue form.

From the very start the EU's aspirations in regard to the information society identified the use of the cultural heritage of Europe as an important force in economic and cultural competitiveness, defining strategies relating to the information society in many ways. In order for these plans to be implemented, a quantitative leap must take place in digitalisation and making digital culture accessible. *The objective is to make two million books, films, photographs and other cultural objects digitally accessible by 2008. According to plans, this figure must increase to six million by 2010.* This quantum leap is expected to be achieved if all European museums, libraries and collections are able to contribute their own digital collections to the European archive.[7]

The main *technical challenge* is to improve digitalisation technology in order to ensure more efficient and affordable digitalisation in the case of audiovisual materials and books. The mass digitalisation of written texts requires more advanced automatic book- and

[7] Digital cultural heritage now has a European portal, called *European Library* at http://www.theeuropeanlibrary.org/portal/, which was created as a response to Google's digitalisation programme. It provides *online* access to an immense amount of Europe's digital treasure. It is well worth a visit, even more so because the number of accessible collections and searchable libraries is increasing by the day.

document uploading device and *higher capacity optical and intelligent character recognition systems, especially to digitalise non-English texts.* The English language optical character recognition (OCR) systems have been tested. They have been used successfully for most printed fonts for about ten to fifteen years and are enhanced with semi-automatic spelling correction algorithms. Similar systems used for other languages are less developed, which means higher costs and results of poorer quality.

Currently, only a small part of European collections are digitalised. Digitalisation is conducted in all EU member states; however these activities are not systematised and their progression is relatively slow. This was taken into consideration when *Google* launched its initiative aimed at digitalising the altogether 15 million books held in four libraries in the United States and one major library in Europe. If this plan is implemented, Google's initiative will considerably surpass any other efforts made on a national level by EU member states. Digitalisation has swung into motion in other parts on the world, too. For example, large-scale plans are on the agenda in India and China to digitalise materials written in various languages. *Digitalisation is a labour-intensive and costly process.* It requires significant investment in advance, often exceeding the funds available at the institutions which are in possession of the information to be digitalised. Digitalising all the relevant sources would be an unfeasible task, therefore decisions must be made in regard to what materials should be digitalised and when.

The objective of the "Digital Libraries" initiative is to make access to Europe's information sources easier and more interesting, in an online environment. The initiative is based on Europe's rich heritage and aims to couple this culturally and linguistically diverse environment with the latest technological achievements and business management solutions. Digital libraries are systematically organised collections of digital content made accessible for the general public. They may comprise *digitalised materials,* such as digital copies of books or other 'physical" products found in libraries and archives, as well as *information sources originally created in digital form.* The latter form is becoming increasingly typical in today's scientific-information world, where digital publications and an immense quantity of information are stored on digital storage spaces. The Digital Libraries initiative is aimed at the digitalisation of both digitalised and digitally created materials. Three main considerations must be kept in mind when identifying the opportunities inherent in digital technologies which ensure a wide-ranging and easy access to information:

- Providing online access in order to ensure maximum benefits which citizens, researchers and economic players can gain from information.
- Digitalising analogue collections in order to ensure a wider-range use of sources in the information society.
- Preservation and storage in order to ensure access to digitalised materials for future generations and to prevent loss of valuable content.

In the European Union the digitalisation of the cultural heritage has an equally cultural, social and economic impact. Europe's libraries and archives hold a vast quantity of materials (including books, periodicals, films, photographs and maps, among other things) attesting to the wealth of European history as well as Europe's cultural and linguistic diversity. *Online access to these materials of many cultures and languages will facilitate the easier understanding of people's own cultural heritage and their appreciation of the heritage of other European nations.* Furthermore, it will provide sources that can be used in learning, work and recreation.

Libraries and archives are also a significant sector in regard to investment and employment. In 2001 a total of 336,673 full-time employees worked in European libraries and the number of registered users was over 138 million. Thus, *their overall impact on the economy can be regarded as significant, and this could be further enhanced by the digitalisation of their sources.* A digitalised European cultural heritage might also boost network traffic. If preserved properly, this material can be reused a great many times. Digitalisation will also contribute to significantly increasing the profit made by businesses involved in developing new technologies.

DIGITAL CULTURE

The second original and exciting area of digital culture is the understanding of how cultural objects created on a digital platform actually operate. This chapter describes the novel "nature" of digital culture, answering questions such as how the elements of digital culture differ and why they transform our world.

1. The nature of digital culture

In the world of digital culture – to use Nicholas Negroponte's expression – only bits (and not atoms) travel (Negroponte, 1995). *The real world and the virtual environment are linked at many points; however, the mediating digital platform itself is immaterial.* This fundamental aspect defines many features of digital culture.

Contemporary culture is basically characterised (among other things) by *instancy, the local interpretation of globalised (and uniform) content,* as well as the worldwide presence of symbols and icons of mass culture. Features in addition to the aforementioned ones are detailed below. Digital elements are created in many ways: primarily with the help of computers, but digital cameras have pushed traditional devices into the background, our telephones are suitable for recording (moving) images and sound, and there is a digital switchover in television and radio broadcasting. Computers are no longer used only as tools to provide us with information digitally in our private lives but they also determine our public lives through e-government, e-health, etc. Furthermore, every "atom" of virtual worlds, which will play an increasingly important role in the future, is digital.

The computer, digital objects, the Internet, and later broadband created new culture-shocks, and all within the last twenty years. *Never before has humankind* – due to the impact of globalisation we can talk about the whole of humankind and not only some nations – experienced so many and such profound changes in such a short period.

When Johannes Gutenberg printed the Bible in 1454, he *actually started a communication revolution.* Seventy years later over one thousand printing presses were operating in Europe. The printed word spread at lightning speed, and it can be claimed that *it gained dominance in culture in the subsequent centuries.* Written texts – in contrast to oral ones – were a rational, easily understandable and reliable channel of communication.[8] Communication via

[8] The relationship between oral and written communication is a far more complex issue. See e.g. Ruth, 1997.

printed texts revealed a more analytical, more rational and more organised world. *The predominance of the printed word was dealt the first blow in the 1950s, when television appeared and started spreading*. The proliferation of digital culture and within that especially that of digital media brought the 450-year dominance of the written word to an irreversible end: written digital texts and digital culture in general require new skills, a new approach and a new understanding.

Digital written communication is much closer to the oral communication that predated the proliferation of printing. Digital media combine texts, images, sounds and data and we, the recipients, perceive these complex messages in a more *complex* way – multi-media reception via multi-channel networks. In a digital environment information spreads at a breathtaking speed and news about a terror attack or about the outburst of an epidemic travels the entire globe within minutes. Due to digital culture, our general knowledge is transformed into the sum of interactive, global and multimedia-type experiences accessible any time and anywhere.

The digital world has many new features, which will be examined below. It is important to note that *none of these features are determined by technology* since all of them are a result of changes in culture. However, we can see a two-way process here: changes in culture induce technological changes, which then also have an effect on culture.

Interactivity

The digital environment creates the opportunity to increase interactions. In a digital environment it feels natural that an image or a piece of music is modified or entirely changed. *There is a trend for our online environment to become more personalised* with modules which we are interested in appearing on our homepages and the same information (e.g. a news item) reaching us in different forms (we can read it *online,* it can come in a newsletter, we can receive it in an *SMS* or read it via an RSS channel), depending on our choice. Targeted advertising appears more frequently: companies want to get their message across to us in as targeted a way as possible by using various automatic techniques. Games are becoming increasingly interactive with the simple choices of the past having been replaced by today's entirely interactive environments – we are given a ready-made dynamic world. In *MMO* games[9], which can only be played *online,* the environment is not generated in advance but is built together by thousands of players. Digital television moves even this "classic" channel towards interactivity.

Interconnectivity

The electronic devices of the information society give us the feeling of constantly being connected. We can be reached on our mobile phones at any time; when we are sitting in front of our computers working *online,* searching for some information or perhaps enjoying some form of entertainment. We can contact our friends who are *online* either by

[9] Massively Multiplayer Online games.

speaking (*Skype,* etc.) or writing *(email)* to them, whichever we prefer. Moreover, because of the convergence of devices and technologies, mobile phones, computers and the Internet are beginning to merge into one unit, a means of providing a permanent interactive connection. The possibility of permanent availability and connection change many traditional cultural patterns ranging from how we use our personal space to how we do our work.

Complexity

Complexity is present at every system level: complex systems can have complex impacts. Devices we use every day are capable of carrying out complex processes at the touch of a button; the speech of a high-ranking politician might make an impact in a stock market at the other end of the world within minutes.

The merging of oral and written communication

Written records form an integral part of most cultures and are generally one of the basic means of preserving and disseminating information. It can be seen that in a digital environment written communication has some characteristics of oral communication as distinct from those of written records, as we understand them in a classic sense. *Chatting,* exchanging electronic messages and various digital objects (e.g. images, series of images, sound and video documents) formally take place in writing; however, these forms of communication and their features appear closer to oral communication. Oral and written communication is merged in a digital environment, harking back to the early centuries of the Gutenberg Galaxy, when similar oscillations could be seen on the borderlines of oral and written cultures.

Speed

All new technology is designed to enhance speed. The first important trend was to increase the speed of changing locations, while today the main aim is to increase the speed of information exchange. This acceleration can be felt in our everyday lives, too: letters no longer take weeks or days to reach their destination but only a few minutes. If someone wants to find a photograph taken of a South American city, he/she no longer has to go to a library and spend hours searching since now it is a routine task that can be done in just a few minutes. With the help of mobile phones we can reach anyone anywhere since we don't have to wait until the person we want to contact gets home. Furthermore, administrative and business information spreads extremely fast and the stock markets of the world have an almost instant connection with each other. This stepped up speed has a depressing effect on a lot of people, who feel it to be one of the drawbacks, and a kind of pressure, characteristic of our modern era.

Intangibility

In a digital environment we are distant from the actual source of information and objects. There is a greater distance between us and the tangible world, and thus *the importance of trust and reliability has increased.* Perhaps one of the greatest cultural shifts has taken place in regard to how we feel about "real" and intangible cultural objects. In other words, is something that is not physically tangible regarded as valuable by the members of a given culture? The seemingly(!) intangible nature of digital cultural objects and patterns can easily lead to loss of substance. However, in the coming decades people will most probably come to accept that *digital actions, digital words and digital objects are real actions, real words and real objects in every sense.*

Convergence

In the context of the information society the strict, originally mathematical sense of **convergence** is interpreted in two senses: on the one hand, it means the ability of various network platforms to provide basically similar services, and on the other hand, it is used to refer to the unification of consumer goods such as the telephone, the television and the personal computer. Convergence is a multifaceted phenomenon and besides information society it is used in politics, in regulation, in the area of services and markets, as well as in intersectoral associations and fusions. Convergence actually refers to a kind of merging together of areas, channels, solutions and products that were previously distinct from one another.

It is the changes resulting from technological convergence that are the most perceptible. Now we can use the Internet when using digital television or we can have a telephone conversation via *PDA* and *Wi-Fi* connections, which is realised through operating several technologies in tandem. The platform neutrality of the Internet protocol plays a crucial role in such fusions. The convergence of technical devices serves the purposes of an increasing concentration of services ("I have one device in my hand which I can use for phoning, taking photos and connecting to the Internet") and miniaturisation: devices with an increasing number of functions take up ever-smaller space. Technological convergence results in telecommunication, informatics and media approaching each other and merging together.

Unpredictability

We live in a world full of uncertainties. In the early stages of computer development we were certain that this device would always be confined to laboratories. Before the Internet spread worldwide we thought that this channel of communication would never become widely popular. Now, only a few decades later, these devices and the opportunities they offer have a profound impact on our lives.

Multitasking

In practice, **multitasking** means that we can do many things simultaneously. It is highly characteristic of media consumption, for example. The trend of secondary media consumption could be seen after the appearance of traditional electronic devices – this mostly meant background listening to the radio – but more recently television is also often used in this way. Intertwined and simultaneously running activities can dissipate our attention and push some elements into the background. Permanent online presence enables interactions in several communication spaces running in parallel, leading to the almost inevitable "fusion" of personal, group and mass communication. Similarly to background media consumption, background communication is also emerging, which – due to permanent broadband connection – means a simultaneous presence in more than one communication space.

2. The environment of digital culture

Digital culture affects many elements of our lives that seemed to be firm and constant. Concepts such as community, publicity, personal rights, ownership and value are beginning to be renewed and changed. The natural environment has always been a key factor in the development and shaping of communities – this solid foundation seems to be disappearing into a digital environment. Opportunities for self-expression have suddenly increased due to digital platforms: *the democratic nature of technology makes it possible for any individual and community to have access to a wide range of publicity on the net.* For example, an artist can now address the entire world (it is another issue whether two-way communication actually takes place or not), and a typical feature of online religion is that the online appearance of a small church can be as impressive, comprehensive and interactive as that of a historical church, despite the fact there is a vast difference in scale when it comes to the actual number of the respective congregations.

Digital information can be detached from its original source and the spreading of digital information is therefore a source of anxiety and doubt for many, owing to its potential for abuse – at first glance we cannot be sure if the information content of a text, a picture or a film excerpt is credible or not. *The critical approach taken to the source of information in our everyday lives takes us back to the concept of information literacy.* Assessing the value of specific information is a central issue in information literacy. Users must be aware of the reliability of digital information and its usability for a particular purpose at all times. However, this approach is at great variance with how the average citizen of previous cultures viewed and handled information.

Another interesting feature of digital information is permanence. Anything we do in a digital environment leaves a trace. The time of opening a document to read is recorded just like the time when it was typed in, and when we view a typical homepage the same amount of information leaves our computer and arrives. The vast information flow makes it difficult to trace all this information but the principle of "all actions being recorded in one way or another" is applicable to every single object of digital culture. *Digital information is easy to copy.* Moreover, if data carriers containing digital content (primarily our PCs) are connected to the network (i.e. connected to the Internet), the possibility for reproducing information further increases. István

Szakadát (Szakadát, without year) pointed out that in the "traditional" world the dissemination of information (books, films or any other cultural objects) follows an *ex post* logic: a traditional work is first multiplied and only distributed – thus made available for consumption – subsequently. In contrast, digital information spreads in exactly the other way, *ex ante:*[10] It is enough to create one prototype without multiplying it since those interested (the consumers) will copy it themselves – reproduction technologies include recording the information on any data carrier or even forwarding the given object to someone else.

There is not enough space in this chapter to review the history of the World Wide Web but one thing must be highlighted: the creators' objective was to design a system which can operate without central control, which they successfully met. If we consider the reproducibility of digital information and the possibility of "linking" onto the World Wide Web, it can be seen that any blocking of digital information and the regulation of the flow of information come up against immense difficulties which are virtually impossible to overcome.

The freedom of digital information has a significant impact on many areas (e.g. politics, media, business, e-democracy, etc.) of culture in a traditional sense. That's why issues pertaining to the freedom and the controllability of the Internet are of such vital importance today.

3. Digital culture and the Internet

Digitally created cultural elements mostly include creations made on computers (texts, images and audio) and their "consumption". The growing popularity of digital cameras and camcorders generated a further large-scale increase of digital data. The appearance and growth of the Internet, which became the most representative area of the information society inducing the most spectacular changes, also resulted in a sudden proliferation of digital culture. The spreading of broadband introduced a new level into this network reality, namely that of interconnectivity and online communities, which is developing before our eyes and which is referred to with a fashionable umbrella term as the "Web 2.0 revolution".

More than one billion Internet users were registered at the end of 2006 worldwide, and the number of Internet users increases by about one hundred million every year. Currently, nearly one sixth of the world's population uses the Internet. The number of broadband users is also growing, with their proportion approaching 5% of the world's population, which means that about one-twentieth of the world's inhabitants use this technology to access the Internet. An increasing number of people spend ever-more time *online.*

The once elite communication channel which was used only by a narrow layer of researchers and educators in the sixties developed into a channel available for masses of people from the mid-nineties. The Internet had the same impact on electronic business that Henry Ford had on the car manufacturing industry: it turned a luxury product accessible for a select few into a relatively simple tool available for many. *This new medium unites the speed and immediacy afforded by the television and the telephone with the depth and thoroughness provided by paper-based communication.*

The turning point in the development of the Internet came when the results of the research and development work conducted by Tim Berners-Lee and his team in the Swiss CERN

[10] Check the chapter on law for the meaning of the expressions *ex post* and *ex ante.*

research institute of physics came to light between 1989 and 1991. This team needed relatively easy access to data, figures and other information stored on other computers to be able to do their research work. For this reason, they developed a network solution, which was made public knowledge in 1991. The online society "jumped at the opportunity" and that is how the glitzy-shiny-jingling *World Wide Web* was born – the multimedia applications and user friendliness of which made it into a suitable medium even in the business world. A great advantage of the *Web* is that *information can be presented attractively through graphic representation.*

There were 19 thousand homepages on the Internet in 1995, which grew to 50 million by 2004. Between 2004 and 2006 the "size" of the Internet doubled and at the end of *2006 the number of individual WebPages exceeded 100 million*, which is an almost unbelievable rate of development.

The number of photographs in *Flickr* photo sharing website increased to over 100 million in February 2006, and 100 million downloads take place daily on *YouTube*. In 2006 almost half of *online* "video consumption" came from clips uploaded by Internet users. Wikipedia, perhaps the most well-known community encyclopaedia *online,* contains almost five million entries in more than one hundred languages. By 2010 the number of downloads and visits to providers like *YouTube* and *MySpace* will exceed 65 billion. The income of the most popular website operators may be more than 900 billion dollars already, and 44 *billion videostreams*[11] will be accessible on the Internet in 2010. The online buzz brought on by broadband has reached incredible proportions – users can virtually luxuriate in online cultural items, in each other's company in the amazing number of *online* communities and communication games. *It is only the lack of the previously detailed information literacy that can limit the exploitation of online culture.*

Digital culture is more than the computer and the Internet. The speed of *mobile communication had already introduced fundamental changes into patterns of social behaviour, relationships and other cultural habits and opportunities. Digital television broadcasting* extended the services provided by analogue television – the media channel that enjoyed the greatest popularity before the appearance of the Internet – by introducing many new technological innovations. The digital platform brought about new opportunities in *radio broadcasting* as well. Furthermore, today's digital citizen is able to "consume" these channels simultaneously, i.e. he can listen, watch and participate in various interactions at the same time, so we could say that in a way *multitasking* prolongs our days.

The elements of digital culture differ from those of "traditional" culture in many ways: they are easy to copy and modify, easy to manipulate and can quickly be shared with others via the Internet. We can find a virtually infinite amount of information on the network, which is why information literacy, which helps us to find our way in this endless jungle, is so crucial. Many people are discouraged by the vast quantity of information and the difficulty of finding their way in it, while others – both individuals and organisations – try to protect themselves by resorting to prohibitions or installing filters. This mass of information should not be feared but people should learn how to use it.

[11] A series of moving images sent/disseminated on the Internet in compressed format. E.g. YouTube operates according to this principle.

Digital objects and the Internet have changed our lives in many ways: not only are they convenient communication channels but they also provide us with online access to a great number of services: we can do our shopping, study, use administrative services, exercise our rights, use entertainment facilities and many other things online. Not only our everyday lives are affected by the digital world but society and the economy as well: many business and cultural models are restructured or disappear and are replaced by new ones. At certain levels, our approach to private property is also changing, exactly because of the above-mentioned features.

In the early stage of its development it was often feared that the Internet would make people lonely, and destroy relationships as well as mental and biological health. Such opinions have died down and almost disappeared due to the community revolution that has become apparent in recent years. It is now clear that *the Internet can truly manifest itself through the unlimited network of broadband connections*. As the number of people connected by the Internet reaches a critical mass and increases even further, entertainment, social relationships and communities come to the foreground. It seems that the negative phenomena associated with the Internet was a result of technical limitations and today's unlimited freedom brings out the genuine power of the Internet – *what we have is not hooked up computers and dead information but the huge, innovative and dynamic network of living people and information they can convert into knowledge.*

SUMMARY

This chapter was devoted to digitalised and digitally created culture. Special attention was paid to information literacy, which is a skill essential for the goal-oriented citizens of the information society to sustain a standard of living they expect now and in the future, and the ability to manage information enabling them to access the objects of digital culture.

Digital culture cannot be understood and cannot exist without traditional culture. It is being gradually integrated into "traditional" culture and represents an increasing part of it. Digital culture has two basic sources: digitalised cultural objects and cultural elements created on a digital platform. During digitalisation cultural objects are converted into a coded format readable by computers. The primary value of digitalisation is preservation (although this aspect has been increasingly criticised) and a further important feature is that digital "materials" enable us to use it in interactive ways. Interactivity appears in research, entertainment and activities carried out in the home. The largest-scale digitalisation is realised in state projects, which are aimed at placing onto a digital platform those important elements of the cultural heritage which, among other things, can enhance competitiveness.

As digital devices become increasingly popular, so digitally created elements play an ever-increasing role in our everyday lives. The mass proliferation of digital cameras, computers, mobile phones, digital television, etc. has generated many new cultural trends. The most important medium of the sudden growth of digitally created culture is the broadband Internet. It must be stressed again that culture created on a digital platform can only be interpreted in the context of traditional culture; however, it is going to represent an ever-greater part of it in the course of the coming years and decades. Digital culture also creates inequalities in our society that did not exist before.

REVISION QUESTIONS

1. To what extent is the skill of information literacy more than just the ability to handle information devices?
2. How does digitalisation differ from other earlier archiving strategies used by humanity? What is a good digital archive like?
3. In what areas of life does digital culture play a part?
4. List some of the characteristic features of digital culture.
5. Think about the extent to which the following permeate an average day in your life: instancy, interaction, interconnectivity and convergence.

BIBLIOGRAPHY

1. Key bibliography

Bruce, C. S. (1997): *The Seven Faces of Information Literacy* (Auslib Press, Adelaide)
Gere, Charlie (2004): *Digital Culture* (Reaktion Books, London)
Negroponte, Nicholas (1995): *Being Digital* (Knopf, New York)
Taylor, P. A.: (2005): Digital Matters: *The Theory and Culture of the Matrix* (Routledge, London)

2. Optional bibliography

Geertz, Clifford (1973): *The Interpretation of Culture* (Basic Books, New York)
Marsh, Jackie (2005): *Popular Culture, New Media and Digital Literacy in Early Childhood* (RoutledgeFalmer, London)
Miller, Rex M. (2004): *The Millenium Matrix* (Jossey-Bass, San Francisco)
Trend, David (2001): *Reading Digital Culture* (Blackwell, Oxford)

ISTVÁN BESSENYEI

Learning and Teaching in the Information Society. eLearning 2.0 and Connectivism

THE CRISIS OF EDUCATION – FINDING A WAY OUT

1. From pedagogical reform to web 1.0

In pre-modern societies, children grew up in a world whose norms and behaviour system was inherited from their elders. Parents got the children involved in their everyday work, into the life of the family and the community, and all the ceremonies. Socialization, work, living conditions and relationships – **informal learning** according to present day terminology – were uniform within the framework of family, relatives, village and church.

In modern industrial societies, specialized institutions took over the tasks of teaching and educating. The school system became multifunctional and performed a range of duties, such as childminding and nurturing, ensuring equal opportunities and mobility, transmitting knowledge, providing a moral upbringing, a general education and satisfying the demands of the labour market. After a while, with the general introduction of compulsory education and the accessibility of higher education, carrying out the mass of heterogeneous tasks became impossible, and the contradictions that ensued led to a growing number of critical phenomena.[1]

There were several answers to the crisis. Pedagogical reformers tried *to model, in a school form, the organic unity of the pre-modern world,* and its most famous representatives chose *child-centeredness, activity centeredness and independence* as their slogans. These experiments all aimed to create islands within which the distances arising from the modern alienated world could be eliminated.[2]

[1] Just think of the radical student movements of the 1960s.

[2] The starting point for Freinet was the unity of activity and cognition and the necessity of democratic education. His pedagogy was child-centred, and independent activities (among others handicraft) were important elements of his methodology. Montessori also based her educational system on her faith in the skills/abilities of children. The basic paradigms were "self-chosen work", independence of the child and freedom. Waldorf schools stress the importance of the unity of aesthetic, intellectual and emotional education and of being close to nature. Their slogans are: autonomy, problem-solving learning and child-centeredness. Dewey's key idea was learning through experience (activities, creation and observation). In his school he tried to model the socialising medium of performing tasks at home, and introduced students' self-government. Rogers advocates that the individual needs personality-centred, helpful interpersonal communication instead of traditional "teaching". (See Pukánszky-Németh, 2001).

Radical critics of the school system imagined its renewal taking place *outside the institution of school*. In his book on the worldwide crisis of education Philip H. Coombs (Coombs, 1968), dreamed of revealing its ills with the help of scientifically based systems analysis, and of solving the crisis with comprehensive, institutional reforms initiated from the top. The ideologists of de-schooling, on the contrary, question the very right of schools to exist. They regard school as a bureaucratic, factory-like institution, an education "kolhoz", the scene of social taming. Their most famous representative, Ivan Illich, outlines the re-socialization of teaching and education, where individuals bypass the formal school system by learning in a self-organising way, from life, contemporary groups and from their elders with the help of critical reflection (Illich, 1971). A system of informal and accidental activities and the exchange of abilities take the place of bureaucratic, industrialized teaching, organised from the top. This model defines public education as a service centre and suggests that a "free choice of partner" in education can be realized with the help of a great communication network.[3]

Thus, already in Illich's time, the notion appeared that networking was able to create completely new tools for knowledge production and kno*wledge exchange*.[4] T*he "deschoolers" based their vision of* re-socialization, of open, self-organising, networking public education on this idea. However, at the time, their reform proposals – open educational institution systems for every generation, organically integrating everyday operators into

[3] In his book entitled "*Deschooling Society",* published in 1971, Ivan Illich states that the future lies in abolishing institutional education. He defines school as an institution which stifles creativity and makes children lose interest in learning, due to its formal rules, hierarchical structure and standardizing effect. As opposed to formal regulations and obligatory curricula/syllabuses, Illich stresses "Most learning happens casually, and even most intentional learning is not the result of programmed instruction. [...] a great deal of learning even now seems to happen casually and as a by-product of some other activity defined as work or leisure". Thus, according to Illich, learning is, on the one hand, a subjective, individual activity, which is squeezed within unnatural borders by the formal school order; on the other hand it is a process which, in most cases, comes about as a component of another activity. In an uncompromising manner, Illich suggests that the only possible solution is to „abolish the obligatory school system and develop individual and collective forms of self-education and self-training. Instead of school, he wished to create something less restricted, a system based on voluntariness and individual freedom, which he called an educational network, the basis of which would be made up of all sorts of educational-training communities. According to his ideas the school without walls appears, which is no longer a school (it should rather be called an anti-school), but rather a network of the possibilities of learning, expanded in time and space," explains Zoltán Czeizer (Czeizer, 1997: 617), summing up Illich's book.

[4] Illich writes the following: "I will use the words "opportunity web" for "network" to designate specific ways to provide access to each of four sets of resources. "Network" is often used, unfortunately, to designate the channels reserved to material selected by others for indoctrination, instruction, and entertainment. But it can also be used for the telephone or the postal service, which are primarily accessible to individuals who want to send messages to one another. I wish we had another word to designate such reticular structures for mutual access, a word less evocative of entrapment, less degraded by current usage and more suggestive of the fact that any such arrangement includes legal, organizational, and technical aspects. Not having found such a term, I will try to redeem the one which is available, using it as a synonym of "educational web."

studying, learning based on cooperation and dialogue, making use of different sources of knowledge, integrating the experience of older and peer groups – remained utopias. Their ideas concerning the realization of the "educational web" – for example establishing a database for learning, making public individual ability-portfolios (**e-portfolios**), organising a network for contemporary groups to pool their expertise, or a reference service of those individuals and institutions who are potential participants in teaching – lacked the necessary highly developed, widely accessible technological infrastructure, and the market pressure of the IT industry did not yet exist.

The situation changed radically when networking technology – at least in the developed countries of the Northern Hemisphere and in Australia – reached the critical level of accessibility and prevalence. There was widespread demand for informal learning and with the slogan of lifelong learning, the political will emerged. These facts caused significant changes in the nature of the criticism against schools: *Illich's utopia of re-socialized learning and socialization within networks suddenly became a real possibility*.[5]

2. Web 1.0, eLearning 1.0

As the use of the Internet spread, it became possible to acquire and store digitised versions of many different kinds of learning content (texts, pictures, audio and video). Although it was possible to access a wide range of information with by this means (known as web 1.0), *it was not yet truly interactive.* Contents could be placed on the homepages and databases, but it was not easy to create one's own content and share it with others. The typical Internet user browsed the web pages and downloaded content, but did not actively participate in the content-creation process.

Parallel to web 1.0 becoming more widespread, **learning management systems, (LMSs)** based on the internet became popular as well: these systems organised the databases, communication tools, task solutions, administration – in other words the whole learning process – into units. *Online* courses, which copied traditional educational patterns, appeared on the World Wide Web in the form of replica modules and lessons. Standardized, time limited, linear courses were created, with tutors and formalized, automatically verifiable tasks. This form of education, eLearning 1.0, is actually the *technologically supported variant of traditional knowledge distribution, the virtual extension of textbooks and classroom teaching.* Even in this environment, learning remained a passive process, managed from above or outside. *The formalized, centralized, bureaucratic world of education of industrialized societies was extended into a digital environment.* (For further details see Downes, 2005a).

[5] We shall not discuss the general questions of lifelong learning or e-learning in this chapter, or their relation to the traditional educational system, or the prevalence of IT tools in education. From the point of view of the subject, these are general questions that are assumed to be known. For those who wish to gain in-depth knowledge of these questions before reading the chapter, we recommend the writings of Bertalan Kommenczi (e.g.: 2001), Kristóf Nyíri (e.g.: 2000), Seymour Papert (e.g.: 1993) or Field (e.g.: 2006).

NETWORK LEARNING ON WEB 2.0. – CONNECTIVISM

1. Web 2.0 and eLearning 2.0 as an answer to the political challenge of lifelong learning

The situation changed completely when the phenomenon called **web 2.0** started to spread. "Digital natives" (Jukes–Dosaj, 2003) of web 2.0 not only searched for information on the web, *but also became content providers themselves.* The areas and tools of interactivity have become practically unlimited. Personal and institutional information is freely available on the World Wide Web and the technology exists to allow individuals to harness collective knowledge and entertainment portals for their own purposes. Students can create and exchange content in a cooperative way, within networks of their contemporaries. Blogs, forums, chats, wikis, newsgroups, and networks of friends and acquaintances provide an immense communal information production and exchange framework. The belief of hitherto criminalised file-sharers – that information is not for hiding but for passing on to others – became widespread. Increasingly sophisticated tools, from refined search engines through Wikipedia to well-maintained debate- and knowledge portals, are available. *By this means it has become possible to construct personally reflected knowledge adapted to one's individual needs from information represented in cyberspace.* These characteristics form the didactic basis of eLearning 2.0.

In the field of eLearning 2.0, knowledge chosen, organised, distributed and controlled by the authorities has been replaced by personal information management based on immediate needs. Consequently, the importance of official intermediaries and institutions is decreasing. Within networks of contemporaries, cooperation, learner-centeredness and the ideal of self-organised learning become a real possibility. The boundary between learning and teaching becomes less distinct. For the *"download generation",* the Internet is not a medium for learning; it is the platform and *the centre of personal study. In the milieu of eLearning 2.0, the opportunity exists to reconstruct an organic learning environment*.[6]

Which developments have generated these changes?

- High-speed broadband Internet (access) has become accessible to large numbers of people, significantly increasing the rate of data acquisition.
- Information has become ubiquitous and can be reached with mobile tools.
- As open **source software** has spread, so content management is very cheap and simple making possible the creation of personalized **e-portfolios**.
- A wide range of new, free tools is at our disposal: blogs, wikis, file exchange programs, forums and tools that make collaborative content development possible.
- Freely usable content has appeared *(open courseware, open content, CCL – Creative Commons Licence).*

[6] Kristóf Nyíri writes the following about this: "It's time we reconsidered Dewey's thesis. He reasoned that we need schools, artificial educational environments because the era when young people spontaneously learned while growing up into the world of adults was over. I believe this situation is rapidly changing nowadays. The environment in which today's children play, communicate and learn is becoming more and more similar to the world in which adults communicate, work, do business and find entertainment. The world of mobile phones and the internet unmistakably becomes an organic learning environment." (Nyíri, 2001).

- New software supporting social networks is spreading rapidly.
- The changeable, uncertain employment situation and the rapid technological changes that school curricula cannot follow have brought about the political challenge of **"lifelong learning".** As an alternative to formal education, company retraining and private courses try to compensate for the shortcomings of the education system. In many cases, companies prefer independently organised, *online* training and the exchange of expertise outside working hours.

It has become a political requirement that students be given the opportunity to participate in web 2.0-based, eLearning 2.0-based education in addition to the traditional, basic school training. As adults, they will only be able to keep up with the challenge of global knowledge exchange and be able to use interactive networks if they become familiar with these tools and opportunities at an early stage. Thus, one of the tasks of formal school training is to develop, in addition to the basic ones, skills that ensure that students feel at home in the 2.0 interactive knowledge-management environment. The most important competences should be searching for and evaluating information and making connections between different fields of knowledge, ideas and concepts. The real didactic question is how, according to their individual needs, students can be brought to the point where they can contextualize and connect information originating from different sources, using the exchange of thought (by way of a network-enabled discourse) and aided by other web 2.0 tools.

The phenomena of web 2.0 pose a new challenge to the traditional school system. If it does not want the gulf between this generation's culture and school to deepen even more dramatically, education must inevitably incorporate the elements of eLearning 2.0 into its repository of tools.

The Apple Education portal demonstrates the cultural differences between the new generation that uses web 2.0 (digital native users) and the teachers who were socialized in the paradigm of industrial society (digital immigrant teachers) as follows:

Digital Native Learners	Digital Immigrant Teachers
Prefer receiving information quickly from multiple multimedia sources.	Prefer slow and controlled release of information from limited sources.
Prefer parallel processing and multitasking.	Prefer singular processing and single or limited tasking.
Prefer processing pictures, sounds and video before text.	Prefer to provide text before pictures, sounds and video.
Prefer random access to hyper linked multimedia information.	Prefer to provide information linearly, logically and sequentially.
Prefer to interact/network simultaneously with many others.	Prefer students to work independently rather than network and interact.
Prefer to learn "just-in-time".	Prefer to teach "just-in-case" (it's in the exam).
Prefer instant gratification and instant rewards.	Prefer deferred gratification and deferred rewards.
Prefer learning that is relevant, instantly useful and fun.	Prefer to teach to the curriculum guide and standardized tests.

Source: Jukes – Dosaj, 2003

2. Network theories and eLearning 2.0

According to Castells, the basic paradigm of the information age is networking and the space of flows which "reigns above the historically constructed space of places [...] In other words, flows become the units of work, decisions and **output-control,** instead of organisations" (quoted by Nyíri, 2006). These prophetic words convey the most important feature of the organisation of learning in the information age. An ever greater part of the processes of learning and socialisation can be moved from the "institutions of stone" to decentralized, self-organising networks supported by information technology – the "space of flows". Learning in this de-institutionalised space is not about an organisation centrally defining the input and expecting that every learner reach the output result within a certain unit of time on a pre-defined, uniform route. In this learning paradigm, the guiding principle is considered to be the common definition of outcomes. *However, the roads leading there are not common – they are individual routes developed from flows within networks connecting personal knowledge with knowledge from external sources.*

Network theory, based on Granovetter's article on the nature of strong and weak (network) ties (Granovetter, 1973), was given a new impetus by the work of Barabási and Buchanan (Barabási, 2002; Buchanan, 2002) at the turn of the millennium. It supports the basic, decentralized, "de-schooled" learning-organisational principles of eLearning 2.0. Barabási and Buchanan pointed out that many networks were scale free. "Scale free distribution means that many network elements have very few neighbours. At the same time, the number of elements with many neighbours is not zero." (Csermely, 2005a: 35). Distribution according to power functions characterises these networks. "Power functions mathematically define the fact that in real networks, the majority of points have only a few ties, and these numerous little points coexist with a few large central points that have an unusually large number of ties" (Barabási, 2002). In his book, Péter Csermely endeavours to prove that *weak ties are what make networks strong.* "A tie between two elements of the network is weak if taking away or adding the tie does not influence in a statistically sensitive way the average of the network's typical characteristics (usually one of the group-defining characteristics of the network). Weak ties stabilize networks" (Csermely, 2005a: 363).

Jones and his co-authors (Jones et al., 2006) examined the role of weak ties in network learning. They interpreted learning as a network process, which includes the ties between the students and their tutors, and the ties between the students and other sources of knowledge. Within this process, all ties are equal and none of them are privileged. (This notion differs considerably from the hierarchical network interpretation of eLearning 1.0, which only concentrates on the strong ties between humans.)

Imagine a centralized learning network, in which the professor, or the compulsory, very formalized syllabus or department represents the central, strong tie, while the interconnec- tions between the students (the exchange of knowledge amongst student), and the connections between students and other information sources are insignificant. The network has few weak ties. If the central element is damaged (the professor becomes ill, the department is closed down, or there is a shortage of the required textbook, which is the unique source of knowledge), the network collapses. *This is because the various weak ties that make the networks strong are missing.* Scale free learning networks, supported by information technologies, are a lot less vulnerable to this kind of disturbance.

In such a network, knowledge sharing amongst students is much better developed. Students store a vast amount of the curriculum in their own **electronic portfolios**. Learning blogs, wikis, forums, social networks (independently created contents) offer additional resources. Students can also be connected to experts, students and lecturers from other institutions and older people. They can intensively use the syllabus-archives created by students from other institutions. Assistant lecturers participate in the network and preserve the knowledge of their professors in their own e-portfolios. Learning becomes collective knowledge management based on many weak ties, and not on the central role of the professor or the formalized syllabus. Apart from a few strong ties, (since the strategic guidance of the professor may still remain important), the network is made up of very varied, heterogeneous weak ties. The network becomes strong: if the professor falls out of the system, the stored knowledge elements and the weak ties that can be mobilized do not allow the network to collapse or weaken.

Perelman, who produced a radical criticism of the school system in the early 1990s, created the concept of hyper learning (HL) to denote this type of network learning:

> "HL is not a single device or process, but a universe of new technologies that both possesses and enhances intelligence. The "hyper" in hyper learning refers not merely to the extraordinary speed and scope of new information technology, but to an unprecedented degree of connectedness of knowledge, experience, media, and brains – both human and non-human. The "learning" in HL refers most literally to the transformation of knowledge and behaviour through experience." (Perelman 1993: 2).

Perelman says that the ubiquitous, intelligent tools of information technology motivate us to participate actively in learning. Broadband information transmission makes it possible for everyone to call upon knowledge everywhere, at any time. Not only do advanced search-engines make navigation on the sea of information possible and effective, but they also efficiently aid understanding and contextualisation. This is all the more true because those tools, based on artificial intelligence, are becoming increasingly effective in the assistance they provide. In the future, the gauge of individual knowledge and the guarantee of success on the labour market may be the informally acquired competence visible on one's electronic-portfolio, and not an official diploma.

3. Connectivism

The basic level of learning theories based on network theory is concerned with the *organisation of individual knowledge* – the cerebral system connecting knowledge elements, in fact, the neuro-psychology of individual knowledge organisation. For an individual's knowledge organisation, strong ties are represented by knowledge elements that have been connected into a formal system. To these are weak information ties, which are more accidental and associated with a set of heterogeneous, weakly embedded aspects. The greater the number of weak pieces of information that surround the knowledge with strong ties, the more willing we are to accept them as valid. The strong tie itself may be strong enough for us to consider the information as valid, but such a condition is a lot more vulnerable. If the source of information which is considered universally valid becomes, for some reason, discredited, that immediately causes all

information originating from that source to become invalid. If, however, this connection is surrounded by versatile, secondary, weak information, then it ensures stability even in the case of damage.[7] Siemens writes the following about this:

> „How does knowledge flow within a network? Which factors have an impact on the process? If we tentatively ascribe life-like properties to our learning networks, we can partly answer this question. Any living organism seeks two primary functions: replication and preservation. Nodes within our networks follow similar aspirations. Established beliefs and learning often ensure that new information is routed through (i.e., contextualized) the existing network. New information is evaluated and coded reflective of the existing meme[8] of the learning network." (Siemens, 2005).

Using the tendencies of the network as a basis, Georg Siemens founded a *learning theory of the information age* called connectivism (Siemens, 2005). In this theory, Siemens surpasses the traditional theories such as behaviourism, cognitivism and constructivism. (Even this last one – which stresses the socially motivated nature of learning – focuses on individual learning techniques and the processes of inner mental activity, and does not take into consideration the way learning takes place in organisations and network structures.)

Connectivism considers learning as a process in which the role of informal information exchange, organised into networks and supported with electronic tools, becomes more and more significant. Learning becomes a continuous, lifelong system of network activities, embedded into other activities. The motivation for gaining and contextualising information becomes stronger if searching and evaluation becomes a cooperative, network activity. Students can significantly improve the efficiency of their learning if they take part in a network, or virtual community dealing with the given subject. Thus the collective knowledge once again becomes a source of individual knowledge ("cycle of knowledge development"). As the number of cooperative activities increases, personal social networks become the scene of informal exchange of expertise, and "communities of practice" develop. Besides the questions of "how" and "what" to learn, we now have the question of "where to learn".

Siemens makes it clear that in networks, contextualising information and determining validity may both become collective processes. (A list of popular topics, useful syllabuses, important links, articles and blogs, compiled in a cooperative manner may serve this purpose.) So-called *feed-aggregators* help the collecting and feeding back of information into one's own knowledge network.[9] *Instead of consuming information that has been embedded in connections by institutions, learning may become an active creation of knowledge.*[10]

4. Network learning – the utopia of restored unity?

The learning-organisational, knowledge-creating theories of eLearning 2.0, hyper learning and connectivism express the hope that networking supported by advanced technology can

[7] This string of thought is based on Péter Csermely's personal statement.

[8] For the theory of memes see Kolin, 2002.

[9] For example *Google reader, xFruits* or *blastfeed.*

[10] For the debate about connectivism, see Verhagen's critique and Siemen's reply. (Verhagen, 2006; Siemens, 2006).

put an *end to the modern division between institutional learning and personal knowledge and become a tool of reintegration.*[11]

There is a desire to decrease the alienation of the world of traditional school with the help of the information flow taking place in the social networks of the virtual world and in cooperative, creative areas of learning. We talk about network communities, organic and open learning environments, the intertwining of everyday activities and learning, the gradual disappearance of the border between spontaneous and institutional learning, the intermingling of childhood and adulthood (see Nyíri, 2001). Although this desire was just a utopia in the age of the early, radical school criticisms, or when the first network learning theories appeared today, in the globalised environment of the information society, creating new forms of embeddedness in the virtual space of social networks has become common practice.

The spread of new forms of learning also implies various potential conflicts. There are numerous signs that the new forms of informal network learning can only be fitted into the narrow, bureaucratically controlled framework of traditional institutions that are limited in time and resources, with great difficulty. The pedagogical debate concerning this issue often goes in the wrong direction, because the discussion is between two incompatible conceptual worlds. An important educational-sociological, network-research and pedagogical question of the coming period will be how the institutions of the official school system will accept this phenomenon, to what extent they will integrate or reject it, and what types of conflicts, compromises and solutions this process will develop.

SUMMARY

In traditional societies, socialisation did not take place in separate institutions, but rather took place in the family and within small communities. In modern societies, specialized institutions have taken over the roles of teaching, educating and child minding. Mass-education could only be organised in a standardized, industrial way. Pedagogical reformers wanted to change this alienated socialization into socialization based on independence that could be provided in child-centred schools. The radical critics of the school system wanted to de-school the whole of society, saying that spontaneous activities and the network of knowledge exchange could replace formal school.

With the spreading of information technology, the utopia of network learning may become a reality, at least technically. A vast amount of spontaneous knowledge exchange is taking place on the interactive World Wide Web. It is on the basis of this that the theories of eLearning 2.0 and connectivism declare that network participation and access to information and to software that interprets and contextualizes information makes a completely new, cooperative, self-organising form of learning possible. This process questions the role of

[11] Kristóf Nyíri writes the following about this: "The border between practical and theoretical knowledge is becoming fluid. Practical training and theoretical education are extremely close. Education in the humanities and in science is getting closer to vocational training and technical training, research is now closer to teaching. Primary, secondary and higher level education overlap now, just as institutionalized learning overlaps with extra-institutional learning" (Nyíri, 1997a: 699).

traditional educational institutions today. While the forms of eLearning 1.0 only meant the mechanical transposition of traditional linear learning to a virtual medium, the mode of operation of eLearning 2.0, (organised into networks, self-organising, embedded into activities) may be the starting point and driving force of a learning-organisational process that takes advantage of the opportunities offered by the information society.

REVISION QUESTIONS

1. Describe, in a few words, learning in traditional societies.
2. What is the difference between the ways in which web 1.0 and web 2.0 work?
3. Why are networks that have a lot of weak ties stronger?
4. What type of social or learning network (newsgroup, forum, chat room, collective games) do you participate in? Describe them from the aspect of the means and content of communication.
5. List what the theory of connectivism says about learning.
6. Which software facilitates the operation of social and learning networks? What characterizes it?

BIBLIOGRAPHY

1. Key bibliography

Downes, Stephen (2005): *E-learning 2.0*
http://www.scn.org/ncn, accessed 14 March 2007
Siemens, Georg (2006): *Connectivism: Learning Theory or Pastime of the Self-Amused?*
http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1, accessed 10 February 2007

2. Optional bibliography

Barabási, Albert-László (2002): *Linked – The New Network of Science: How Everything Is Connected to Everything Else and What it Means* (Perseus Books, Cambridge MA)
Schuler, Douglas (1996): *New Community Networks: Wired for Change* (Addison-Wesley Publishing Company, http://www.elearnmag.org/Articles/connectivism-response.doc, accessed 14 March 2007)

RÓBERT PINTÉR

Popular buzzwords, supernarratives and metanarratives for development: What does the term "information society" mean?

POPULAR BUZZWORDS

The **information society** is a rather complex, variegated and diverse research field. It comprises many topics, where thorough discussion is not feasible in a textbook of only 13 chapters. Hence, many interesting areas and exciting phenomena had to be left out of our textbook. Our main reason for this was that by detailed discussion of numerous exceptionally specialized themes in a textbook of a general character we would have exceeded the limits of our interpretation, our framework and our space.

At the same time, it is possible to show in a tabular form what we have reviewed and what has been left out of the book. In our table below we also indicate the topics and popular buzzwords that characterize the field after the turn of the millennium, and which may stimulate you, the interested reader, to make further investigations.

Of course, the list of buzzwords cannot be complete, and it has further shortcomings too: in certain respects it is inaccurate because it mixes up lesser and greater parts of sub-topics, and the keywords may reflect confusion regarding some socio-economic, scientific and political concepts. This disorder and the lack of clarity are not the result of a careless compilation of the list: the items are important and, for the time being, ineluctable attributes of the field, signifying that the whole area of investigation is not yet quite mature. However, even with its mixed character it demonstrates that the information society represents an extraordinarily diverse field which requires a multidisciplinary approach in order to begin to understand it.

Popular buzzwords and sub-fields of the information society (in alphabetical order, for the sake of simplicity):

- broadband Internet;
- content industry;
- diffusion, penetration, application and use of information and communication technologies (ICT);
- digital culture, cultural heritage, digitalisation;
- digital divide, e-inclusion, accessibility, ICT and socially disadvantaged groups (for example, senior citizens, Roma and other minorities, etc.);
- e-commerce, e-economy, network economy;
- e-democracy, cyber-democracy, participation, e-voting, political parties' presence on the Internet;

- e-governance, e-administration;
- e-health;
- electronic signature;
- e-readiness, ranking lists, statistics;
- freedom of information;
- grid structures, networks and computer technology;
- hacker ethics, hacker activities and cracking;
- identity, virtual identity, identity theft;
- informatics in education, e-learning, distance learning, online learning, e-universities;
- information literacy, digital literacy;
- information overload, data smog;
- information warfare, cyber-terrorism;
- intellectual property rights and their violation, "creative commons", online piracy, software patents;
- intelligent settlements, intelligent towns, regional information society;
- Internet addiction;
- minorities, hate propaganda on the Internet;
- mobile telephony;
- new media (e.g., digital television, Internet radio, podcasting, etc.);
- online games, massive(ly) multiplayer online role-playing games (MMORPG);
- open source software;
- peer-to-peer networks, sharing of music and film files, torrents;
- productivity of information and communication industries, software industry, hardware industry;
- protection of personal data, surveillance, control;
- public Internet access points;
- regulation and administration of the Internet;
- research and development, innovation systems, innovation politics;
- sex and pornography on the Internet;
- strategies of the information society;
- telework;
- the future of the Internet (e.g., semantic Web, quantum Internet, interplanetary Internet);
- ubiquitous computer technology;
- various activities performed on the Internet (e.g., e-mail, chat, banking, telephoning, etc.);
- virtual communities, community pages;
- virtual reality, cyberspace;
- viruses, unwanted electronic mail (SPAM), data fishing (data dredging, mining, snooping), security, etc.;
- Web 2.0 and its characteristic phenomena (blog, wiki, tag, feed, RSS, podcast, etc.).

From the above list it is clear that ICTs have penetrated all aspects of our lives. The list also shows that every sub-system of society (politics, economy, education, public health services, etc.) is attempting to use the technology and to meet the challenges posed by an infor-

mation society. As we mentioned in the first chapter, numerous buzzwords in the list referring to information and communications technologies are mistakenly identified by many individuals with the information society itself.

By studying the list, it may be easier to understand why so many people make this mistake. These buzzwords also show the conceptual laxity which characterizes research in the area and often intermingles facts or phenomena from real life with political jargon and commercial slogans. The fervour for innovation represented by the popularity of these buzzwords may influence scientific research, too, strongly attracting scientists or, on the contrary, repulsing scientists, sometimes endangering the objectivity of surveys and investigations.

The topics covered in our textbook, in contrast to the technological examples mentioned above, concentrate on the introduction of theoretical fundamentals, on the impact of changes affecting various subsystems of society and on political efforts in the field. In this way, they have dealt with the following major issues:[1]

- the concept and historicity of the **information society**;
- the role of technology in society, **technological determinism, technorealism**;
- the phenomena of networking, including the **network society, network economics** and the **network state**;
- changes in the perception and utilization of space and in spatial connectivity, **globalisation**;
- the enhanced role of **innovation** in both the economy and society;
- issues of legal regulation, **law in the information society**;
- **information policy and strategy** of the European Union;
- **electronic government** and administration;
- **the digital divide** and equal opportunities in the information society;
- digital culture, **digitalisation** of the cultural heritage, **information literacy;**
- electronic education, **life-long learning.**

We claim that these subfields are the most important areas forming the backbone of the information society, and that they reflect the many faces of our sociological, political, and economic perspectives. One of the main objectives of this chapter is to justify, from a theoretical perspective, the selection of the items chosen in our first list to reflect basic questions of social and political development. This selection is also required for in-depth analysis, in order to avoid conceptual vagueness. It is also made inevitable by limits on our space. We have justified why we have chosen those issues that are included in this volume: this discussion is leading us back again to the meaning of the concept of an information society.

[1] While introducing these topics, we also often mentioned, in a concise way, the phenomena included in the first list (for example, in connection with the utilization of space, we talked about MMORPG taking place in virtual reality, etc.). In other words, we deal with topics that do not necessarily appear in the above list, while parts of them are often contained in one or more items of the list. The reason for this is that the individual chapters of the textbook focus on the most important subfields, while the buzzwords might refer either to some particular phenomena or to the same larger subfields as those covered in the textbook (for example e-economy).

THE TENSION BETWEEN GRAND THEORY AND DAILY PRACTICE

Dessewffy suggests that in the social sciences where we are dealing with the emergence of an information society, primarily in sociology, the following three major research areas have been proposed (Dessewffy, 2004):

1. Meta-level: since the publication of the three-volume opus of Manuel Castells on *The Information Age* (1996, 1997, 1998), earlier aversion towards postmodernism and the theories of post-industrial society has significantly diminished in and beyond sociology. Current social phenomena demand that we reflect on Castells' ideas, even if we do not regard his books as the ultimate source. Other authors like Beck or Giddens also discuss a new kind of modernity – one cannot ignore evidence that a new modern era is clearly discernable, and in order to understand this, it is necessary to make thoughtful well-organized, careful investigations.
2. Internet: the Internet transforms the world and initiates new processes. It makes its appearance in traditional sociological fields, which were in the forefront of interest in the 20th century, such as **social capital**, political participation, connection networks and social inequalities. The problem is that we are now at the initial stages of major changes in society, and consequently the majority of research activities have only just begun: we have only now started to formulate our questions and hypotheses. More problematic, the cycles of research in the social sciences (typically 10-12 years) are too long to fully comprehend the rapidly developing effects of the Internet. Therefore, if we want to understand the new phenomena appearing in our lives, we have to make sure that our research efforts keep up with the pace of the processes taking place around us.
3. New themes: finally, entirely new social phenomena appear which hitherto did not exist in that form even if their very shadowy beginnings could be discerned.[2] We can expect that more and more such research fields of revolutionary significance will emerge and will need to be explored in the future.

Thus, it seems evident that a basic textbook dealing with the information society has to select its approach and conceptual framework from these three levels. This book, even though it focuses on rather general phenomena emerging in the information society instead of concentrating on the Internet or on the new phenomena referred to above, does not approach the subject exclusively at the first (meta-) level, as might seem suitable for purposes of theoretical discussion. However, there is a good practical reason for this. Meta-level research done by theoreticians engaged in the social sciences, that is, *grand theory,* in many cases does not at all reflect certain significant aspects of our subject matter chosen for discussion here, namely, the information society "as it is".

As we saw in the chapters dealing with the policies of the European Union, e-governance or the digital divide, in everyday life the players in the political arena and the economy as well as many other practitioners refer to the "information society" as symbolic of the spread of information technology and the Internet: succinctly for the ubiquitous practical utilization of computers. Grand theory, on the other hand, interprets an information society in the

[2] Lawrence Lessig's book on "code" is an example of this (Lessig, 1999).

widest possible sense, as the totality of today's (post) modern and post-industrial world emerging from the sixties or seventies of the 20th century onward, and focuses primarily on social processes that may be initiated or enhanced by technological developments. From this perspective, everything that has happened in the world during the last three or four decades can be regarded as part of the emergence of an "information society", since we have been using this particular term for as long as that.

Thus, when writing this textbook we had to discuss important questions and represent phenomena of the information society without having a firm, well-established theoretical foundation, because grand theory, save for one or two conceptual developments, does not pay enough attention to numerous problems of practical significance.

Castells and other theoreticians do not write about electronic governance, about e-Europe, about the digital divide or about e-learning, even though these and other themes are frequently referred to among the popular buzzwords, which the students and other interested readers of this textbook meet on a daily basis. They must therefore feel that the problems signified by them are much closer to reality than the more remote and theoretical concepts of social science, which may be too abstract to take in. The theory does not raise questions about those efforts that politicians and other key players in socio-economic life make in generating policy for developing the information society. It does not comprehend information strategies, or monitoring progress in building up the information society, or the special dilemmas of the "new economy", the widespread myths regarding the new technologies and about the practical problems of becoming a user of them. In other words, the theory does not include predictions to help us understand several basic issues that members of society identify with the main characteristics of an information society.

Theoreticians do not use the popular buzzwords that practitioners use nowadays arising in the world of work, leisure and the media. These range from "telework" to "electronic signature" and "intelligent settlements". Actually, there are several "information societies": first, a comprehensive one, which theoreticians examine and analyse, second, a narrower perspective, which is being built by those interested in progress and development, and third, one which includes society's members who are less interested and uninitiated. The latter could not care less about some crucial questions of the information society, which in fact are of vital importance for them too.

It was our objective to attempt to connect and merge these more or less separate worlds, so that the textbook would not be of a too remote and abstract theoretical character. However, we did not want to become superficial either by dealing only with generalities, or slavishly reflecting the short-lived slogans of politics and commerce. We hope that the chapters of this book actually allow some insight not only into theoretical dilemmas but also into practical everyday problems. We hope that at the same time, they shed light on the contrast between different worlds or "layers" of the information societies referred to which exist in parallel: the comprehensive view of grand theory, the narrower view of politics and public life, and the practical view of everyday reality.

The world of theory may appear to be quixotic, unrelated to practical problems. The political approach is often full of jargon and slogans, and sometimes expresses a blind revolutionary faith that widespread use of information and communication technologies will, of itself, be capable of resolving vital political and economic problems. Finally, the common sense perspective often reduces the complex issues at hand to particular questions of our use

of various devices offered by ICT. An integrated discussion of these different alternatives may be capable of reducing the misunderstanding we described above because we may achieve a theoretical clarity combined with practical understanding.

Often this complexity of interpretation creates some sort of "schizophrenia" for researchers into the information society and for many of those cogitating over the subject. While we are discussing an information society, we may not really grasp the deep complexity of the concept, which may be extremely difficult to comprehend, and certainly cannot be interpreted solely by the social sciences. Sometimes it is necessary to accept the narrower focus of political and economic considerations or the everyday perspectives of mass culture, even if these may be more superficial.[3]

Problematically, a contradictory situation arises. Scientific theories exist but they can only be used to a limited extent: with regard to the subject as it presents to us in the real world. For example in public efforts to further develop the information society, we have plenty of direct experience but very few measured results of empirical investigations. In the final analysis, it is our assertion that familiarity with the grand theories elaborated by Castells and others further discussed and classified into five clusters by Webster (1995), is at best a *necessary* but certainly not a *sufficient* condition for understanding the current processes and the trends of further development of information society.

Firstly, these theories discourse exclusively on "mainstream" development (predominantly from the perspective of the developed western societies) and the rest of the world remains outside the scope of their inquiry. Secondly, the information society is interpreted only in general technological terms, neglecting the interests of the players involved in the processes of development. Thirdly, only certain phenomena and not the general trends of ongoing development of the information society are discussed and analysed. Fourthly (with perhaps the sole exception of Castells) the grand theories which are used to interpret the process of "informatising" our societies, had their golden hour at the end of the eighties and in the early nineties of the 20th century, and now they are behind the times by decades. The incredibly fast, dynamic progress made since the middle of the nineties seems to have escaped the attention of those early researchers completely; they have not followed up the sequels to study them.

The consequence of all this is that, save for one or two exceptions, "grand theory" has virtually ceased to be able to offer a clear and comprehensive picture of the information society, and it is no longer even the subject of contemporary discourses. Not only is it useless for politicians and the active interpreters of real socio-economic life, but it also does not provide a firm conceptual platform for researchers. For example, let us just think of those who are trying to measure Internet penetration or to explore societal questions of certain info-communication technologies?

A further consequence of this regrettable situation is that in when we take up the available academic conceptual framework, it is virtually impossible to gain an insight into several important aspects of the information society and its relevant subject matter, or to examine current developments and to investigate related changes in the fields of politics and the economy. Therefore, when writing our textbook, we decided that in addition to introducing the

[3] These three (scientific-theoretical, political, and mass cultural) approaches will be discussed in detail later on.

theoretical fundamentals, we would have to discuss in detail some facets of the actual political practice in this field. We were determined to resist the temptation to use certain fashionable slogans, but to approach the subject from the direction of comprehensive themes likely to be more enduring in the long run than many of yesterday's and today's popular topics.[4]

A SUPERNARRATIVE FOR DEVELOPMENT AND COMPETING METANARRATIVES

1. The information society as a supernarrative for development

If we are to discuss practical politics, in addition to pointing out the limitation of investigations by the social sciences, we have to consider the socio-political context within which the statements in our textbook were formulated: the community of the European Union. The development of information society has been identified by its advocates with the spreading of ICT and the use of the new tools offered by the new technologies, in the context of the Union, since the publication of the Bangemann Report in the ninth decade of the 20th century (Bangemann, 1994). This demonstrates that the concept of the information society has been interpreted as a **supernarrative for development.**

The *eEurope* programme package (eEurope, 2000; eEurope+2003, 2001; eEurope 2005, 2002) can essentially be regarded as a development programme the aim of which is to improve access to the Internet throughout Europe. Maintaining the enhancement of services to be made available over the Internet, the EU documents entitled *i2010* (i2010, 2005) placed the media and renewal of innovation policies at their centre. Since the year 2000, all public efforts in this field have been made subservient to the so-called Lisbon objectives (The Lisbon European Council [...], 2000), whose overall aim is to make Europe "the most competitive knowledge-based society" (the expression "knowledge-based society" to be interpreted here and now as "information society") in the world by 2010. In other words, this goal stands above all other aims and objectives so we are dealing with a supernarrative that, in principle, is meant to be the guide for all development projects.[5]

Thus, in the European context, the information society is a supernarrative for development, and, at the same time, it is also an interpretative framework for European societies' technological development. It will provide a focus for political discourse, specific worldview, which should guide the Union's decision-makers in setting comprehensive directions for the development of our society for the future. If the information society is conceived as a supernarrative for development, then every problem in society can be viewed through this perspective, and every project to facilitate development can be oriented to the goal of building a competitive information society that will increase people's well being and overall qual-

[4] Who would use today, for example, the term "information superhighway", even though it was extremely popular in the second half of the last decade?

[5] Only in principle because, as we saw in the chapter written by Lilla Juhász, the „Lisbon objectives" could not be adhered to, and the Union has not been successful in executing its ambitious programs.

ity of life through the spread of ICT. All this, if successfully executed,[6] can render political decisions legitimate and can establish an all-round system of goals, while creating cutting edge identity for society that can be relied upon in the transition period leading further into the 21st century.

Before and after the decade which finished at the turn of the millennium, such programmes for rapidly developing our information society were adopted by many nations within and without the European Union notably Singapore, Malaysia and the countries of the former Soviet block. However, most of those countries did not take the challenge seriously enough and did not exert the required Herculean effort. We admit that this happened here in the Union too, where the Lisbon objectives eventually met with failure, though a number of the member nations achieved notable successes.

2. The information society as a competing metanarrative

Naturally, this is not the only narrative, there are several competing metanarratives. These metanarratives attempt to give sufficiently comprehensive explanations of what may be going to happen with humankind in the new millennium. Such alternatives are proposed for example, in the theories of a "postmodern society" (Lyotard, 1979), of "post-industrial society" (Bell, 1976), of "post-capitalist society" (Drucker, 1993), or of a "risk society" (Beck, 1992). We might also mention here theories of "globalisation" and the conceptualisations of "sustainable progress" (United Nations, 1987). Finally, we should mention the durable earlier ideas of the "welfare state" and the "consumer society": even though these ideas are not as universal in character as those above, they have played an important part in western thought and politics during the second half of the 20th century and continue to do so.

Without going deeper into an explanation of these concepts or taking sides in the controversies, we must point out that the information society in such interpretations is no longer the supernarrative but only one of the competing metanarratives that project one or another *readings of reality,* and they do not represent *reality itself.*

In plain language, we are not building an information society, but it is society's current progressive processes that can be interpreted as leading to the emergence of an information society, just as society's inevitable progress can be explained by the emergence of a consumer society or as the next stage of capitalism, or as a crisis in the welfare state. The present stage of modernity can be interpreted as an "unsteerable juggernaut travelling through space" (Giddens, 1990), as the risk society, as the "clash of civilizations" (Huntington, 1997 [1996]), or as "perverse integration" (Castells, 1996). All of which refer to the same period of time. Presumably, we are correct in concluding that none of the above represents the absolute truth. Does this mean that in our conceptualisation of an "information society" no more than one of the possible perspectives or, in other words, just another metanarrative is reflected?

[6] See the example of Finland (Castells and Himanen, 2002).

THE MEANING(S) OF THE TERM "INFORMATION SOCIETY": A FINAL ANALYSIS

Having taken all these divergent lines of thought into consideration, we may have quite confused about whether the theory or the actual practice of building an "information" society would be of any use for us, and whether it is possible to define the information society at all. At this point, we can summarize *very briefly* what we have learnt from the textbook about this conceptual framework. Doing so, we hope, it will restore our self-confidence to what it was. After all, it is worthwhile to review the chapters of the book, and we shall see that now that we are furnished with useful knowledge, there are ample reasons to use this term "information society".

1. Information society as first encountered: Utopia vs. Reality?

Whoever wants to investigate and understand the information society has to discriminate at least two interrelated but opposing spheres of phenomena, which can be separated from each other only in theory:

- At the first encounter, we find that the *information society is a conceptual framework, replete with values and norms*. It is used to denote a positive *UTOPIA* and a negative DYSTOPIA at one and the same time. As we have already seen in the first chapter, both technophile and technophobic ideas abound in information society either intertwined or separated.
- By the same token, the term *information society is a name given to an existing socio-technical REALITY*. It signifies the epoch that is presently succeeding so-called modern society, that which took shape after the industrial revolution. This shift is taking place before our eyes in the form of technological, economic, and cultural changes and can be observed, as we illustrated our first chapter, in modifications of the employment and production control structure as well as in other important structural aspects of social life (Webster, 1995).

As an inevitable consequence of this fundamental duality, significant misunderstandings can arise among the participants of any investigation, development project or controversy relating to the information society. It is easy to comprehend that their preconceptions, prior knowledge, expectations, and fears are different. We find that even those doing research talk different languages. While for some the term "information society" signifies reality, and a tool for understanding the world and effecting changes in it, for others it means an unapproachable, unknown, and not particularly attractive realm of ideas, remote from real life. It may even seem downright threatening!

2. Information society revisited: theoretical, political and everyday approaches

In addition to our conception of a reality intertwined with utopia, we can also discern another closely interrelated, threefold system of approaches to the information society. These differ from each other either in who proposes the definition, or the timeframe within

which it is set: in what period of time do we consider we saw the onset of the shift to it or when indicators of it appear, or, again, in the change in quality of the content and the maturity of the definition.

1. Table. Three approaches to the information society

Definition	Onset	Advocates	Content
Theoretical (descriptive, exact)	After World War II, from the sixties or the seventies of the 20th century on	Theoreticians, social scientists, researchers	Technology Employment structure Economy Spatio-temporal structure Cultural values, norms[7]
Political (promotional, program-like)	From the nineties of the 20th century forward[8]	Politicians, technocrats, entrepreneurs and expert advisors to business and Govt.	Political program "Revolution from above" Modernization as the main objective Those lagging behind shall drop out
Everyday, prosaic (amorphous, utopian)	Not before 2010 or 2020 forward	Mainstream media, participants of utopian controversies, sci-fi movies	Ubiquitous and total information and communication technologies

Source: Pinter, 2004: 31

As we proceed downwards in the table, the definitions become progressively more and more difficult to grasp, and the onset of the information society shifts to later and later dates, finally into the future. It can be seen clearly from the table that all kinds of discourses, investigations, and political initiatives relating to the information society, as well as the achievements and aspirations in the economy, manifest themselves in an extremely complex manner.

Thus, in order to present a comprehensive outline of an objective knowledge base for the ever-changing, dynamic profile of the information society, we need to understand the interrelations of all the three approaches described above. We have to integrate the theoretical-paradigmatic, the political-promotional, and the prosaic-utopian perspectives. All three kinds of definition have to be considered simultaneously in order not to repeat the mistakes of our parents and grandparents in our investigations concerning the information society.

[7] See Webster's typology (1995), outlined in the introductory chapter.

[8] From the appearance of the first modern information strategies on (e.g. Singapore, 1992).

3. Information society encountered for the third time: technology, society, narrative and science in focus

As we saw in the first two chapters of our textbook, the information society is a new mode of social synthesis, determined by the utilization of ICT, the emergence of a network society producing a network economy and paradigmatic cultural changes at the same time.

In definitions of the basic concept different features of the information society might be emphasized, depending on who formulates the definition. The key phenomena might be the visible diffusion of *information and communication technologies,* the continuing fundamental *socio-economic transformations,* the *political programs for development,* or, finally, the results of *scientific research being* carried out in this field. Thus, we have four different but equally rational viewpoints; a technological, a societal, a political and a physical science perspective with which to study the information society each presenting a different picture.

Based on our preceding discussions we can define the information society in four different ways:

1. In terms of *technology,* ICT and various operations for processing knowledge and information play the central role in information society.
2. From the perspective of the whole *society,* the emergence of a network society and a network economy, of new types of community, of continuous adaptation to an ever-changing environment, of new kinds of inequality, and globalisation are the main characteristics of an information society.
3. According to the *political narrative,* the term "information society" refers to a new paradigm, which is transforming the late industrial epoch. It refers to a new way of conceptualising the world, and might be described as a supernarrative for development, as we saw above.
4. Finally, from a scientific perspective, there is a wide field of research called *information society studies*: this is exactly what we are presenting to you in our textbook – to characterize this landscape, let us refer here again to Webster's typology (Webster, 1995).

4. Missing an exactly defined concept

In all the examples we have discussed, it is apparent that we do not have a definitive conception of the information society. We can regard it as a theoretical construction or as reality, as a technological revolution or as a political programme, as a meta-narrative or supernarrative, as a new paradigm or as a research field for scientific investigations by social scientists, or, in plain terms, as the context of our working days in the 21st century. The list could continue, however, the gist of the matter must be clear by now: we ourselves have to decide how we understand the information society and whether we wish to engage with it or not? This textbook is intended to help those interested in coming to a conclusion of their own: this was, after all, our fundamental objective in explaining the complex nature of information society.

SUMMARY

By reviewing our whole book in this concluding chapter we have tried to show the way to an answer to the question how the content of our textbook was selected and compiled as it was. By so doing we have come to understand how we may, possibly think about the information society at this, the beginning of the 21st century.

In the first part of the chapter, we surveyed a number of popular buzzwords. After seeing the list the reader may justifiably ask why they have not been discussed in this, an introductory textbook. The first reason for this are the controls limiting our space (a textbook consisting of only 13 chapters cannot deal with every detail of its subject matter) moreover, the topics indicated by the buzzwords cannot be discussed on a uniform level because scientific concepts, political catchwords, and business-oriented slogans intermingle in the list.

However, there are other reasons why the book is limited to certain social science theories and to some central political topics. We had to consider the present state of professional engagement with the grand theories of social science which is a prerequisite for taking part in the discourse on the relevant questions, while remembering, on the other hand, that those theories were, bogged down at the end of the eighties or in the early nineties of the 20th century. With the exception, that is, of the work of Manuel Castells. The social phenomena most frequently at the centre of discussions (see buzzwords) have little connection with grand theories, thus, it is impossible to explore them relying on a firm theoretical basis. For this reason, paying attention to real political intentions and programs for development is especially important for understanding and interpreting the current situation. Consequently, in our textbook we had to concentrate simultaneously on social theory and political practice.

In the context of Europe's political efforts, we have suggested that in the European Union the information society is regarded as a supernarrative for development, the priorities for which were laid down in the Lisbon objectives (2000). In reality, the failure of the Lisbon strategy and the emergence of other metanarratives might offer a future challenge to the privileged status of the "information society", both in regard to the public projects which are intended to facilitate information society development, whatever that might prove to be and possibly to the working out of social processes associated with it as well.

Finally, when we summarized the approaches to and the definitions of the information society in previous chapters, we urged our readers to decide for themselves what these explanations meant for them: is it a utopian theoretical construction, a technological revolution, their own everyday environment, the field of their scientific inquiry or something entirely different. This textbook should serve as a guide for orientation in the densely interwoven, multi-dimensional network of all these intriguing questions concerning the information society.

REVISION QUESTIONS

1. Could you mention any popular buzzwords that are missing from our list?
2. What do you think we mean by suggesting that "building up an information society in the European Union can be regarded as a supernarrative for development"?
3. What competing metanarratives, in addition to that of the information society, could help us understand the world since World War II?

4. On what basis have we stated that the information society is both a utopia and a concise description of reality at the same time?
5. What characterizes the theoretical, political, and everyday approaches to the information society?
6. What is at the heart of the technological aspect of an information society? Similarly, what defines the social aspect of information society?

BIBLIOGRAPHY

1. Key bibliography

Castells, Manuel (1996): *The Information Age: Economy, Society and Culture Volume I. The Rise of the Network Society* (Blackwell, Oxford)
Webster, Frank: What Information Society? (in: *The Information Society,* Vol. 10(1), 1–23)
The Information Society Quarterly

2. Optional bibliography

Beck, Ulrich (1992): *Risk Society: Towards a New Modernity* (Sage)
Bell, Daniel (1976): *The Coming of Post-Industrial Society: a Venture in Social Forecasting* (Basic Books, New York)
Drucker, Peter F. (1993): *Post-Capitalist Society* (Harper Collins, New York)
Giddens, Anthony (1990): *The Consequences of Modernity* (Polity Press, Cambridge)
Huntington, Samuel P. (1997 [1996]): *The Clash of Civilizations and the Remaking of World Order* (Touchstone, Simon and Schuster, New York)
Lyotard, Jean-François (1979): *The Postmodern Condition* (Manchester University Press)

Bibliography

2006 *Korea Internet White Paper* (2006) (http://eng.mic.go.kr/eng/secureDN.tdf?seq=10&idx=1&board_id=E_04_03, accessed 20 January 2007)

Agre, Philip E. – Rotenberg, Marc (1998): *Technology and Privacy: The New Landscape* (The MIT Press, Cambridge, Mass.)

Alabau, Antonio (2003): *Understanding the e-Government Policy of the European Union. A comparative analysis with the e-Government policies of some supra national Organizations Working Document* (Reference: PTSI/24. Universidad Politecnica de Valencia)

Albert, Fruzsina – Dávid, Bea – Molnár, Szilárd (2006): Az Internet-használat és a társadalmi tőke időbeni alakulása Magyarországon. Egy longitudinális vizsgálat eredményei (in: Internet.hu *3. A magyar társadalom digitális gyorsfényképe* 3., TÁRKI, Budapest, 69-110.)

Anderson, Paul (2007): What is Web 2.0? *Ideas, technologies and implications for education* http://www.jisc.ac.uk/media/documents/techwatch/tsw0701.pdf, accessed 23 June 2007)

Andretta, Susie (2005): *Information literacy: a practitioner's guide* (Chandos Publishing, Oxford)

ARIN (2007): *Global IP Addressing Statistics* (http://www.arin.net/statistics/statistics.pdf, accessed 11 July 2007)

Bakos, Ferenc (1973): *Idegen szavak és kifejezések szótára* (Akadémiai Kiadó, Budapest)

Bangemann Report (1994): *Europe and the Global Information Society* (http://ec.europa.eu/idabc/servlets/Doc?id=18174, accessed 13 July 2007)

Barabási, Albert-László (2002): *Linked – The New Network of Science: How Everything Is Connected to Everything Else and What it Means* (Perseus Books, Cambridge MA)

Barabási, Albert László (2005): *Behálózva* (presentation at Mindentudás Egyetem http://www.mindentudas.hu/magazin2/20050913albertlaszlo.html, accessed 1 February 2007)

Bawden, Daniel (2001): Information and digital literacies: a review of concepts (in: *Journal of Documentation* vol. 57, no. 2, March 2001, 218-259)

Beck, Ulrich (1992): *Risk Society: Towards a New Modernity* (Sage, London)

Behrens, S. J. (1994): A conceptual analysis and historical overview of information literacy (in: *College and Research Libraries* 55/4, 309-322)

Bell, Daniel (1976): *The Coming of Post-Industrial Society: a Venture in Social Forecasting* (Basic Books, New York)

Bell, Daniel (1980): The Social Framework of the Information Society (in: Forester, T. /ed./ *The Microelectronics Revolution: The Complete Guide to the New Technology and Its Impact on Society,* MIT Press, Cambridge, Mass.)

Bellia, Patricia L. – Schiff-Berman, Paul – Post, David G. (2006): *Cyberlaw: Problems of Policy and Jurisprudence in the Information Age* (West Group, Berkeley)

Beniger, James R. (1986): *The Control Revolution. Technological and Economic Origins of the Information Society* (Harvard University Press)

Berkman L., – Kawachi I. (eds.) (2000): *Social epidemiology* (Oxford University Press, Oxford)

Bernhardt, U. – Ruhmann, I. (1995): *Frankfurter Rundschau.* (15 November 1995)

Bijker, Weibe E. – Hughes, Thomas P. – Pinch, Trevor (eds.) (1987): *The social construction of technological systems: New directions in the sociology and history of technology* (MIT Press, Cambridge, Mass)

Borsi, Balázs (2004): *A technológia és tudásáramlás szerepe a magyar vállalati versenyképesség szolgálatában.* (www.pm.gov.hu/Dokumentumok/Seo/fuzetek.htm, accessed 20 March 2007)

Bourdieu, Pierre (1986): The Forms of Capital (in: Richardson /ed./ *Handbook of Theory and Research for the Sociology of Education,* Greenwood Press, New York)

Bőgel, György: Merre tart a K+F? A nemzetközi munkamegosztás átrendeződése a kutatás és a fejlesztés területén (in: *Információs Társadalom* 2006/3.)

Bradshaw J. – Kemp P. – Baldwin S. – Rowe, A. (2004): *The Drivers of Social Exclusion. A review of the literatur*e (Office of the Deputy Prime Minister, London)

Braun, Tibor (2003): A hálózatok új tudományának előfutára: Karinthy Frigyes (in: *Magyar Tudomány,* 48/12 http://epa.oszk.hu/00700/00775/00061/2003_12_24.html, accessed 13 July 2007)

Brodsky, Joseph (1995): Collector's Item (in: *On Grief and Reason – Essays,* Farrar, Straus and Giroux, New York)

Bruce, C. S. (1997): *The seven faces of information literacy* (Auslib Press, Adelaide)

Brunn, S. – Leinbach, R. (eds.) (1991): *Collapsing Space and Time: Geographic Aspects of Communications and Information* (Harper Collins, London)

Buchanan, Mark (2002): *Nexus: Small Worlds and the Groundbreaking Science of Network*s (W. W. Norton & Company Inc., New York)

Buckland, Michael (1991): *Information and Information Systems* (Greenwood Press, New York – Westport, Connecticut – London)

Callon, Michel (1987): Society in the making. Technology as a tool for sociological analysis (in: Bijker, Weibe E. – Hughes, Thomas P. – Pinch, Trevor /eds./ *The social construction of technological systems: New directions in the sociology and history of technology* MIT Press, Cambridge, Mass)

Campbell, Dennis – Bán, Chrysta (eds.) (2005): *Legal issues in the global information society* (Oceanan Publications, New York)

Cap Gemini Ernst & Young (2002): *Online Availability of Public Services: How Does Europe Progress? Web Based Survey On Electronic Public Services* (Overall Report Oct 2001 – Oct 2002)

Cap Gemini (2006): *Online avability of public service: How is Europe Progressing* (http://www.capgemini.com/news/2003/0206egov.shtml, accessed 12 July 2007)

Castells, Manuel (1996): *Information Age: Economy, Society and Culture, Volume I:* The Rise of the Network Society (Blackwell, Oxford)

Castells, Manuel (1997): *Q&A With Manuel Castells* (an interview by Cliff Barney, in: Upside http://www.netfront.to/full_transcript.html, accessed 2002 or http://artefaktum.hu/it/Castells_interju.html, accessed 12 July 2007)

Castells, Manuel (1997): *Information Age: Economy, Society and Culture, Volume II: The Power of Identity* (Blackwell, Oxford)

Castells, Manuel (1998): *The Information Age: Economy, Society and Culture,* Vol. III.: The End of the Millennium (Blackwell, Oxford)

Castells, Manuel (1998): *Information technology, globalisation and social development* (UNRISD Conference on Information Technologies and Social Development, Geneva 1998, http://www.

unrisd.org/unrisd/website/document.nsf/d2a23ad2d50cb2a280256eb300385855/f270e0c066f3de7780256b67005b728c/$FILE/dp114.pdf, accessed 14 July 2007)

Castells, Manuel (2006): The Network Society: from Knowledge to Policy (in: Manuel Castells – Gustavo Cardoso /eds./ *The Network Society: From Knowledge to Policy,* The Johns Hopkins University Press, Center for Transatlantic Research Relations, Washington, DC)

Castells, Manuel – Himanen, Pekka (2001): *Suomen tietoyhteiskuntamalli* (Sitra 242, Porvoo, WSOY)

Castells, Manuel – Himanen, Pekka (2002): *The Information Society and the Welfare State – The Finnish Model* (Oxford University Press, Oxford)

Center for Social Informatics (School of Library and Information Science, Indiana University, Bloomington. www.slis.indiana.edu/kling, accessed 13 May 2005)

Centre for Economic and Social Inclusion (2002): *Social Inclusion* (http://www.cesi.org.uk/kbdocs/socinc.doc, accessed 13 July 2007)

CoBrA *Recommendations to the eEurope Advisory Group eGovernment Beyond 2005 – Modern and Innovative Public Administrations in the 2010 horizon.* (http://europa.eu.int/information_society/activities/egovernment_research/doc/cobra_recommendations_for_eGovernment_beyond2005.pdf, accessed 12 July 2007)

Cole, Jeffrey – Robinson, John (2002): Internet Use and Sociability in the UCLA (in: *IT&Society,* Volume 1, Issue 1, Summer 202-218.)

Coleman, S. James (1988): Social Capital in the Creation of Human Capital (in: *American Journal of Sociology,* Vol. 94 Supplement: Organizations and Institutions: Sociological and Economic Approaches to the Analysis of Social Structure. pp. S95-S120)

Coleman, S. James (1990): *Foundations of Social Theory* (Harvard University Press, Cambridge)

Coleman, Stephen (2005): *Direct representation, towards a conversational democracy* (IPPR, London).

Constant II, E. W. (1980): *The Origins of the Turbojet Revolution* (The Johns Hopkins University Press, Baltimore)

Coombs, Philip H. (1968): *The World Educational Crisis: A Systems Analysis* (Oxford University Press, Oxford)

Correa, L (2001): The Economics of Telecommunications Regulation (in: Walden, I. – Angel J. /eds./ *Telecommunications Law,* Blackstone, London)

Cummings, Jonathon – Butler, Brian – Kraut, Robert (2002): The quality of online social relationships (in: *Communications of the ACM,* 45(7), 103-108.)

Curtis, Pavel (1992): Mudding: Social Phenomena in Text-Based Virtual Realities (in: *Intertek* Vol. 3.3 Winter, 1992 http://www.eff.org//Net_culture/MOO_MUD_IRC/curtis_mudding.article, accessed 14 July 2007)

Cutcliffe, Stephen H. (1990): The STS Curriculum: What Have We Learned in Twenty Years? (in: *Science, Technology, & Human* Values, Volume 15, Number/Issues3, 360-372, http://links.jstor.org/sici?sici=0162-2439%28199022%2915%3A3%3C360%3ATSCWHW%3E2.0.CO%3B2-J, accessed 25 March 2007)

Czeizer, Zoltán (1997): Játék és tanulás az interneten (in: *Educatio* 4: 615-619 http://www.neumann-haz.hu/tei/educatio/educatio/1997tel/studies/1czeizer/1czeizer_hu.html#tfoot7, accessed 16 March 2007)

Csermely, Péter (2005a): *A rejtett hálózatok ereje. Mi segíti a világ stabilitását?* (Vince Kiadó, Budapest)

Csermely, Péter (2005b): *A hálózatok sejtjeinkben és körülöttünk* (presentation at Mindentudás Egyetem, http://www.mindentudas.hu/csermelypeter/20050911csermely.html, accessed 14 March 2007)

Davies, William (2003): *You Don't Know Me, but... Social Capital and Social Software* (The Work Foundation, London, http://www.theworkfoundation.com/Assets/PDFs/you_dontknowme.pdf, accessed 13 July 2007)

Department for Education and Skills (2002): *Get on with it* (http://www.dfes.gov.uk, accessed 13 July 2007)

Dessewffy, Tibor – Z. Karvalics, László (2002): Az új törvénykönyv (internet, technológia, társadalom) (in: *Kritika* 31. 2002/1, 2-6. http://www.ithaka.hu/index.php?name=OE-DocManager&file=download&id=2815&keret=N&showheader=N, accessed 11 January 2007)

Dessewffy, Tibor (2004): *A World Internet Project hazai kutatása* (presentation at ITTK Szakmai Klub, 13 May 2004)

DETR – Department of Transport, Local Government and the Regions (2000): *Indices of Deprivation* (IMD) (http://www.communities.gov.uk/pub/631/IndicesofDeprivation2000SummaryPDF158Kb_id1128631.pdf, accessed 13 July 2007)

Digital Divide Network, The (http://www.digitaldividenetwork.org, accessed 13 July 2007)

Dordick, Herbert S. – Wang, Georgette (1993): *The Information Society. A retrospective view* (SAGE Publications, Newberry Park, California).

Downes, Stephen (2005a): *E-learning 2.0* (http://elearnmag.org/subpage.cfm?section=articles&article=29-1, accessed 10 February 2007)

Downes, Stephen (2005b): *An Introductuion to Collective Knowledge* (http://www.downes.ca/cgi-bin/page.cgi?post=33034, accessed 14 March 2007)

Downes, Stephen (2005c): *Community Blogging* (http://www.downes.ca/cgi-bin/page.cgpost=14, accessed 1 March 2007)

Downes, Stephen (2006): *Learning networks and connective knowledge* (http://it.coe.uga.edu/itforum/paper92/paper92.html, accessed 17 November 2006)

Doxiadis, C. A. (1975): *Anthropopolis. City for Human Development* (W. W. Norton & Company Inc., New York)

Döbel, R. (1999): Power and Powerlessness in the Global Village: Stepping into the 'Information Society' as a Revolution from Above (in: *Electronic Journal of Sociology* 4, 3.)

Drucker, Peter F. (1988): The coming of the new organisation (in: *Harvard Business Review* 66/1, January-February, 39-48.)

Drucker, Peter F. (1993): *Post-Capitalist Society* (Harper Collins, New York)

Duff, Alistair S. (2000): *Information Society Studies* (Routledge Research in Information Technology and Society, Routledge)

Durkheim, E. (1951 [1897]): *Suicide: A Study in Sociology* (The Free Press of Glenco, New York)

Dworkin, Ronald (1986): *Law's empire* (Harvard University Press, Cambridge)

Employment Café, The (http://www.employment-cafe.co.uk/home/index.asp, accessed 13 July 2007)

eEurope (2000): *An Information Society for All* (http://www.e-europestandards.org/Docs/eeurope_initiative.pdf, accessed 13 July 2007)

eEurope 2005 (2002): *An Information Society for All* (http://ec.europa.eu/information_society/eeurope/2005/all_about/action_plan/index_en.htm, accessed 13 July 2007)

eEurope+2003 (2001): *A co-operative effort to implement the information society in Europe – Action plan* (http://ec.europa.eu/information_society/eeurope/plus/index_en.htm, accessed 13 July 2007)

eGovernment RTD 2020. *Visions and Conceptions of European Citizens* (Second draft of roadmap: visions, scenarios and measures – draft version of 8 August 2006, http://www.egovrtd2020.org/, accessed 12 July 2007)

Eisenberg, M. – Berkowitz, L. (1990): *Information problem-solving* (Ablex, New Jersey)

Eliot, T. S. (1949): *Notes Towards the Definition of Culture* (Harcourt, Brace, New York)

Elstad, J. (1998): The psycho-social perspective on social inequalities in health (in: Bartley, M. – Blane, D. – Smith, Davey G. /eds./ *The sociology of health inequalities,* Blackwell, Oxford)

Empirica (2006): *Benchmarking in a Policy Perspective. Report n. 5: eInclusion.* (Gesellschaft für Kommunikations- und Technologieforschung mbH, Bonn)

EU: Europe spends 11.9 bn yearly on eGovernment – could boost EU25 GDP to 166 bn by 2010 (eGovernment News – 21 June 2006 – EU Institutions – Benchmarking, http://ec.europa.eu/idabc/en/document/5664/194/, accessed 15 July 2007)

European Commission (2000a): *Communication: "Building an Inclusive Europe"* (http://europa.eu.int/eur-lex/en/com/cnc/2000/com2000_0079en02.pdf, accessed 13 July 2007)

European Commission (2000b): *Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions. Social Policy Agenda* (http://europa.eu.int/comm/employment_social/general/com00-379/com379_en.pdf, accessed 13 July 2007)

European Commission (2006): *European Innovation Scoreboard 2006.* (www.proinno-europe.eu/doc/EIS2006_final.pdf, accessed 12 July 2007)

European Commission (2007): *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. i2010 – Annual Information Society Report 2007.* (http://ec.europa.eu/information_society/eeurope/i2010/docs/annual_report/2007/070329_com_en.pdf, accessed 13 July 2007)

European Commission (2007): *Fostering Innovation in Services. A Report of the Expert Group on Innovation in Services.* (www.europe-innova.org/servlet/Doc?cid=7550&lg=EN, accessed 12 July 2007)

European Commission (2007): The 2004 EU industrial *R&D investment scoreboard.* (http://iri.jrc.es/research/scoreboard_2004.htm, accessed 12 July 2007)

European Working Group on Empowering the Excluded (1999): *Conditions for Empowerment: Identifying Descriptors. Working paper* (ECOTEC, Birmingham)

eUser Project (2005): *Europeans want easy-to-find, useful and accessible public online services – but supply is short* (http://www.euser-eu.org/ShowDocument.asp?FocusAnalysisDocumentID=31, accessed 12 July 2007)

Feenberg, Andrew (2001): Looking Forward, Looking Backward: Reflections on the 20th Century (in: *Hitotsubashi Journal of Social* Studies 33(1): 135–142.)

Feenberg, Andrew (2003): *What Is Philosophy of Technology? Lecture for the Komaba undergraduates* (http://www-rohan.sdsu.edu/faculty/feenberg/komaba.htm, accessed 2 April 2007)

Field, John (2006): *Lifelong Learning and the New Educational Order* (Trentham Books, Londodn)

Finnegan, Ruth (1977): *Oral Poetry* (Cambridge Uiversity Press, Cambridge)

Florida, Richard (2002): *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life* (Basic Books, New York)

Fontana, Eduardo Ribas – Sørensen, Carsten (2005): From idea to blah! Understanding mobile services development as interactive innovation (in: *Journal of Information Systems and Technology Management* Vol. 2, No. 2, 2005, 101-120. http://www.jistem.fea.usp.br/ojs/index.php/jistem/article/viewFile/16/14, accessed 10 April 2007)

Fukuyama, Francis (1995): *Trust: The Social Virtues and the Creation of Prosperity* (Free Press, New York)

Gallie, D. – Paugam, S. (2002), *Social Precarity and Social Integration* (http://europa.eu.int/comm/employment_social/soc-prot/soc-incl/eurobarometer_en.pdf, accessed 13 July 2007)

Gareis, Karsten (2003): *Benchmarking Regions in the Information Society* (empirica GmbH, Bonn, Germany. EISCO 2003, November, Aalborg)

Geertz, Clifford (1973): *The Interpretation of Cultures* (Basic Books, New York)

Generics Group, The (2004): *Attitudes to Digital Television* (http://www.digitaltelevision.gov.uk/pdf_documents/publications/Attitudes_to_Digital_Television.pdf, accessed 29 May 2007)

Gibson, William (1984): *Neuromancer* (Ace Books, New York)

Giddens, Anthony (1990): *The Consequences of Modernity* (Polity Press, Cambridge)

Giddens, Anthony (1991): *Modernity and Self-Identity: self and society in the late modern age* (Stanford University Press, Stanford, CA)

Giddens, Anthony (1997): The Globalizing of Modernity (in: Sreberny-Mohammadi, Annabelle – Winseck, Dwayne – McKenna, Jim – Boyd-Barrett, Oliver /eds./ *Media in Global Context: A Reader,* Arnold, London, New York)

Giddens, A. (2000): *Runaway World: How Globalisation is Reshaping our Lives* (Routledge, London)

Global Scenario Group (2002): *Great Transition – The Promise and Lure of the Times Ahead* (Environment Institute, Stockholm http://www.tellus.org/seib/publications/Great_Transitions.pdf, accessed 13 July 2007)

Granovetter, M. (1973): The strength of weak ties (in: *Am J. of Sociology* 78: 1360-1380 http://www.stanford.edu/dept/soc/people/faculty/granovetter/documents/TheStrengthofWeakTies.pdf, accessed 23 February 2007)

Growth, Competitiveness and Employment: the Challenges and Courses for Entering into the XXIst century (1993) (European Commission, Brussel)

Gupta, Raj-Wilemon, David (1996): Changing patterns in industrial R&D management (in: *Journal of Product Innovation Management* 1996/6.)

Hanifan, Lyda J. (1916): The Rural School Community Center (*Annals of the American Academy of Political and Social Science* 67: 130-138.)

Hart, Herbert L. A. (1997): *The Concept of Law* (Oxford University Press, Oxford)

Harvey, David (1990): *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Blackwell, Oxford, England; Cambridge, Mass.)

Hayles, Katherine (1996): Boundary Disputes: Homeostasis, Reflexivity and the Foundations of Cybernetics (in: Robert Markley /ed./ *Virtual Realities and Their Discontents,* The Johns Hopkins University Press, Baltimore, 12-40)

Hronszky, Imre (2002): *Kockázat és innováció – A technika fejlődése társadalmi kontextusban* (http://vmek.oszk.hu/01500/01548/01548.pdf, accessed 17 March 2007)

Hughes, Thomas P. (1987): The Evolution of Large Technological Systems (in: Bijke, Weibe E. – Hughes, Thomas P. – Pinch, Trevor /eds./ *The social construction of technological systems: New directions in the sociology and history of technology,* MIT Press: Cambridge, Mass)

Hughes, Thomas P. (2000): *Industrial revolutions: from canal systems to computer networks* (http://www.lib.utah.edu/gould/1999/lecture99.html, accessed 11 April 2007)

Huntington, Samuel P. (1997 [1996]): *The Clash of Civilizations and the Remaking of World Order* (Touchstone, Simon and Schuster, New York)

i2010 (2005): *A European information society for growth and employment* (http://ec.europa.eu/information_society/eeurope/i2010/index_en.htm, accessed 13 July 2007)

i2010 eGovernment Action Plan (2006): *Accelerating eGovernment in Europe for the Benefit of All* {SEC(2006) 511}. (http://ec.europa.eu/information_society/activities/egovernment_research/doc/highlights/comm_pdf_com_2006_0173_f_en_acte.pdf, accessed 12 July 2007)

Ito, Youichi (1991): *Birth of Joho Shakai and Joho-ka Concepts in Japan and Their Diffusion Outside Japan* (Keio Communication Review 13: 3-12)

*ITU NGN-GS*I (2003) (http://www.itu.int/ITU-T/ngn/index.phtml, accessed 11 April 2007)

Ivan, Illich (1971): *Deschooling Society* (Harper & Row, New York http://www.preservenet.com/theory/Illich/Deschooling/intro.html, accessed 23 March 2007)

Jakku, Emma – Thorburn, Peter (2006): *A sociological framing of participatory development of agricultural decision support systems* (http://arts.monash.edu.au/ges/research/regclim/downloads/jakku-and-thorburn-submitted-sept-2006.pdf, accessed 10 April 2007)

Johnson, David R. – Post, David G. (1996): Law And Borders – The Rise of Law in Cyberspace (in: *48 Stanford Law Review 1367*)

Jones, C. – Ferreday, D. – Hodgson V. (2006): Networked Learning, a relational approach – weak and strong ties (in: Banks, S.–Hodgson, V.–Jones, C.–Kemp, B.–McConnell, D.–Smith, C. /eds./ *Proceedings of the Fifth International Conference on Networked Learning 2006,* Lancaster University, Lancaster http://telearn.noe-kaleidoscope.org/warehouse/Jones-Chris-2006.pdf, accessed 12 July 2007)

Jukes, Ian – Dosaj, Anita (2003): *Digital Tools for Digital Students. The InfoSavy Group* (http://www.apple.com/au/education/digitalkids/disconnect/landscape.html, accessed 12 July 2007)

Justino, P. – Litchfield, J. (2003): Poverty Dynamics in Rural Vietnam: winners and losers during the reform (in: *PRUS Working Paper* no.10, Department of Economics, University of Sussex, UK)

Kamal, Ahmad (2005): *The Law of Cyber-Space* (United Nations Institute for Training and Research, Genf)

Kaplan, Daniel (2005): *eInclusion. New Challenges and Policy Recommendations* (http://ec.europa.eu/information_society/eeurope/2005/doc/all_about/kaplan_report_einclusion_final_ version.pdf, accessed 13 July 2007)

Karinthy, Frigyes (1929): Minden másképpen van (in: *Ötvenkét vasárnap,* Athenaeum, Irodalmi és Nyomdai Rt., Budapest)

Kariyawasam, R (2001): Interconnection, Access and Peering: Law and Precedent (in: Walden, I. – Angel J. /eds./ *Telecommunications* Law, Blackstone, London, 136-223)

Katz, Jon (1997): The Digital Citizen (*Wired,* 1997/12)

Kawachi, I. – Berkman, L. (2000): Social cohesion, social capital, and health (in: Berkman, L. – Kawachi, I. /eds./ *Social epidemiology,* Oxford University Press, Oxford)

Kedzie, Christopher L. (1997): The Third Waves (in: Kahin, Brian – Nesson, Charles: *Borders in Cyberspace: information policy and the global information infrastructure,* Harvard University Press, Cambridge, Mass)

Kelly, Kevin (1998): *New Rules for the New Economy* (Viking Adult, New York)

Király, Gábor: Hovatovább STS? (in: *Replika* 2005/51-52, 25-56. http://www.replika.hu/pdf/51/51-02.pdf, accessed 2 April 2007)

Kiss, János (ed.) (1997): *Innováció és versenyképesség* (http://mek.oszk.hu/01500/01549/01549.rtf, accessed 12 July 2007)

Klein, Hans K. – Kleinman, Daniel Lee (2002): The Social Construction of Technology: Structural Considerations (in: *Science, Technology & Human Values* 27(1): 28–52.)

Kline, Ronald – Pinch, Trevor (1999): The social construction of technology (in: MacKenzie, Donald – Wajcman, Judy /eds./ *The Social Shaping of Technology,* Open University Press, New York)

Kline, S.J. – Rosenberg, N. (1986): An Overview of Innovation (in: Landau–Rosenberg /eds./ *The Positive Sum Strategy. Harnessing Technology for Economic Growth,* National Academy Press, Washington)

Kling, Rob (1999): What is Social Informatics and Why Does it Matter? (in: *D-Lib Magazine* 1999/1)

Kok, Wim (2003): *Enlarging the European Union Achievements and Challenges, Report of Wim Kok to the European Commission* (http://ec.europa.eu/enlargement/archives/pdf/enlargement_ process/ past_enlargements/communication_strategy/report_kok_en.pdf, accessed 10 April 2003)

Kok, Wim (2003): *Jobs, jobs, jobs creating more employment in Europe, Report of the Employment Taskforce chaired by Wim Kok* (http://ec.europa.eu/employment_social/employment_strategy/ pdf/etf_en.pdf, accessed 15 January 2004)

Kok, Wim (2005): *Facing the challenge, the Lisbon strategy for growth and employment, Report from the high level group chaired by Wim Kok,* http://ec.europa.eu/growthandjobs/pdf/2004-1866-EN-complet.pdf, accessed 5 January 2005)

Kolin, Péter (2002): Evolúció és kultúra (in: *Információs Társadalom* 2: 78-128)

Komenczi, Bertalan (2001): *Az információs társadalom iskolájának jellemzői.* (http://www.oki.hu/cikk.php?kod=informatika-Komenczi-Informacios.html, accessed 12 June 2007)

Kondor, Zsuzsanna (without year): *A kultúra fogalmának és tartalmának változása Cicerótól Carey-ig* (http://www.phil-inst.hu/uniworld/kkk/crosscul/kondor/1.htm, accessed 4 June 2007)

Kopelman, Josh (2006): 53,651 (http://redeye.firstround.com/2006/05/53651.html, accessed 13 July 2007)

Korte, B. Werner (2003): *Measuring and Benchmarking the Information Society int he EU and EU Candidate Countries* (eEurope+ International Workshop, Prague)

Krajcsi, Attila (2000): Az internettel kapcsolatos régi problémák (in: *Jel-Kép* 2000/3. 3-10)

Kranzberg, Melvin (1985): The information age: evolution or revolution (in: Guile, Bruce R. /ed./ *Information Technologies and Social Transformation,* National Academy of Engineering, Washington, DC)

Kraut, Robert – Kiesler, Sara – Boneva, Bonka – Cummings, Jonathon – Helgeson, Vicki – Crawford, Anne (2002): Internet Paradox Revisited (in: *Journal of Social Issues,* Volume 58, Number 1, Spring 2002, 49-74(26))

Kraut, Robert – Patterson, Michael – Lundmark, Vicki – Kiesler, Sara – Mukhopadhyay, Tridas – Scherlis, William (1998): Internet paradox: A social technology that reduces social involvement andpsychological well-being? (in: *American Psychologist,* 53, (9), 1017-1032.)

Kraut, Robert – Rainie, Lee – Shklovski, Irina (2004): The Internet and Social Participation: Contrasting Cross-Sectional and Longitudinal Analyses (in: *Journal of Computer-Mediated Communication 10* (1))

Krieger, N. (2000): Epidemiology and social sciences: towards a critical reengagement in the 21st century (*Epidemiology Review* 11: 155–63)

Kuhlthau, C. (1987): *Information skills for an information society: a review of research* (ERIC Clearinghouse on Information Resources, Syracuse, New York)

Kuhlthau, C. (1993): *Seeking meaning: a process approach to library and information services* (Ablex, Greenwich CT)

Kuhn, Thomas S. (1996): *The Structure of Scientific Revolutions* (University Of Chicago Press; 3rd edition)

Kumon, Shumpei (2001 [1994]): *Theory of Information-oriented Civilization* (NTT-shuppan, Tokyo)

Kunitz, S. J. (2001): Accounts of social capital: the mixed health effects of personal communities and voluntary groups (in: Leon, D – Walt, G /eds./ *Poverty, inequality, and health: an international perspective,* Oxford University Press, Oxford)

Kurokawa, Kisho (2000): An Unrealized Project – Centre Georges Pompidou (in: *Virtual Architecture. Tokyo University Digital Museum,* http://www.um.u-tokyo.ac.jp/dm2k-umdb/publish_db/books/va/english/illusive/16.html, accessed 25 January 2007)

L. Kroeber – Kluckhohn, Clyde (1963): *Culture, a critical review of concepts and definitions* (Alfred A. Knopf, Inc. and Random House, Inc., New York)

Larsen, Graeme D. (2005): Horses for courses: relating innovation diffusion concepts to the stages of the diffusion process (in: *Construction Management and Economics* 23:8, 787-792. http://dx.doi.org/10.1080/01446190500204770, accessed 10 April 2007)

Latour, Bruno (1992): Where are the Missing Masses? Sociology of a Few Mundane Artefacts (in: Bijker, Wiebe E. – Law, John /eds./ *Shaping Technology, Building Society: Studies in Sociotechnical Change,* MIT Press, Camb-ridge, MA http://www.bruno-latour.fr/articles/article/050.html, accessed 10 April 2007)

Law, John (1987): Technology and Heterogeneous Engineering: The Case of Portuguese Expansion. (in: Bijker, W.E. –Hughes, T.P. –Pinch, T.J. /eds./ T*he Social Construction of Technological Systems: New Directions in the Sociology and History of Technology,* MIT Press, Cambridge, MA)

Law, John (1992): *Notes on the Theory of the Actor Network: Ordering, Strategy and Heterogeneity* (http://www.lancs.ac.uk/fss/sociology/papers/law-notes-on-ant.pdf, accessed 10 April 2007)

Lessig, Lawrence (1999): *Code and Other Laws of Cyberspace* (Basic Books, New York)

Letenyei, László (2003): A kapcsolatháló regénye (Review on Albert Laszlo Barabasi: Linked, in: *Szociológiai Szemle,* 2003/1)

Levine, Peter (2001): The Internet and Civil Society (in: *iMP Magazine,* May 2001)

Lisbon European Council – An Agenda of Economic and Social Renewal for Europe (2000): (Contribution of the European commission to the special European council, Brussel http://www.europarl.europa.eu/summits/lis1_en.htm, accessed 10 March 2003)

Living and Working in the Information Society: People First – Green Paper (1996) (European Commission Directorate General Employment, Industrial Relations and Social Affairs, Brussel http://ec.europa.eu/employment_social/knowledge_society/docs/green_en.pdf, accessed 20 February 2002)

Lynch, J. W. – Smith, Davey G. – Kaplan, G. A. – House, J. S. (2000): Income inequality and mortality: importance to health of individual incomes, psychological environment, or material conditions (in: *BMJ* 2000; 320: 1200–4)

Lyotard, Jean-François (1979): *La condition postmoderne* (Les Edition de minuit, Paris)

Machlup, Fritz (1962): *The Production and Distribution of Knowledge in the United States* (Princeton University Press, Princeton, N. J.)

MacKenzie, Donald – Wajcman, Judy (eds.) (1985): *Social Shaping of Technology* (Open University Press, Milton Keynes and Philadelphia)

MacManus, Richard – Porter, Joshua (2005): *Web2.0 for Designers. Bootstrapping the Social Web* (http://www.digital-web.com/articles/web_2_for_designers, accessed 14 March 2007)

Majtényi, László (2006): *Az információs szabadságok. Adatvédelem és a közérdekű adatok nyilvánossága* (Complex Kiadó Jogi és Üzleti Tartalomszolgáltató Kft., Budapest)

Märker, Oliver (2005): *Online-Mediation als Instrument für eine nachhaltige Stadt und Regionalplanung* (Aachen)

Martin, William J. (1995): *The Global Information Society* (Aslib Gower, London)

Masuda, Yoneji (1980): *The Information Society as Post-Industrial Society* (The World Future Society, Tokyo, IIS, Washington D. C.)

Mattelart, Armand (2001): *Histoire de la Société de l'Information* (La Découverte, Paris)

Mayfield, Ross (2003a): *Socialtext: Social Software Solutions.* (http://radio.weblogs.com/0114726/2003/03/28.html#a369, accessed 13 July 2007)

Mayfield, Ross (2003b): *Social Capital of Blogspace* (http://radio.weblogs.com/0114726/2003/04/09.html#a391, accessed 13 July 2007)

Merton, R. K. (1968): *Social Theory and Social Structure* (Free Press, New York)

Milgram, Stanley – Travers, Jeffrey (1969): An Experimental Study of the Small World Problem (in: *Sociometry* 32/4, 425-443.)

Millard, J. (2003): *ePublic Services in Europe: Past, Present and Future* (Research findings and new challenges, prepared for the European Commission's Institute for Prospective Technological Studies (IPTS), Sevilla, Spain, September 2003. http://www.cordis.lu/ist/about/socio-eco.htm, http://www.beepgovernment.org, accessed 12 July 2007)

Miller, Rex M. (2004): *The Millenium Matrix* (Jossey-Bass, San Francisco)

Molnár, Szilárd (2003): *The Explanation Frame of the Digital Divide, Proceedings of the Summer School, "Risks and Challenges of the Network Society"* (Karlstad University, Sweden)

Molnár, Szilárd (2004): Sociability and Internet (in: *Review of Sociology* Vol. 10 (2004) 2, 67-84.)

Naisbitt, John (1984): *Megatrends – Ten new directions transforming our lives.* (Futura Macdonald and Co., London and Sydney)

Naisbitt, John (2005): *High Tech/High Touch* (An interview by Blake Harris. http://www.blakeharris.com/bh1/content/view/20/2/, accessed 11 July 2007)

NAPs/inclusion (http://europa.eu.int/comm/employment_social/news/2001/jun/napsincl2001_en.html, accessed 13 July 2007)

Negroponte, Nicholas (1995): *Being Digital* (Knopf, New York)
Nie, Norman H. – Erbring, Lutz (2000): Internet and Society: A Preliminary Report (in: *IT & Society* 1(1): 275-283. http://www.stanford.edu/group/siqss/itandsociety/v01i01/v01i01a18.pdf, accessed 13 July 2007)
Nie, Norman H. – Hillygus, D. Sunshine (2002): The Impact of Internet Use on Sociability: Time-Diary Findings (in: IT & Society 1(1):1-20. http://www.stanford.edu/group/siqss/itandsociety/v01i01/v01i01a01.pdf, accessed 13 July 2007)
Nie, Norman H. – Hillygus, D. Sunshine – Erbring, Lutz (2003): Internet Use, Interpersonal Relations and Sociability: A Time Diary Study (in: Wellman and Haythornthwaite /eds./ *The Internet in Everyday Life,* Blackwell Publishers, Oxford) http://www.people.fas.harvard.edu/~hillygus/Wellmanchapter.pdf, accessed 13 July 2007)
Nyíri, Kristóf (1997): Nyitott oktatás és távoktatás (in: *Educatio* 4: 699-706 http://www.neumann-haz.hu/tei/educatio/educatio/1997tel/studies/8nyiri/8nyiri_hu.html, accessed 21 January 2007)
Nyíri, Kristóf (2000): A virtuális egyetem filozófiájához (in: *Liget,* February 2000 http://www.hunfi.hu/nyiri/vil_ve.htm, accessed 21 March 2007)
Nyíri, Kristóf (2006a): Castells, The Information Age (Book review, in: *Replika* 2006/12 http://www.replika.hu/archivum/36/12, accessed 5 March 2007)
Nyíri, Kristóf (2006b): Virtuális pedagógia – a 21. század tanulási környezete (in: *Új Pedagógiai Szemle* 2006/07-08. http://www.oki.hu/oldal.php?tipus=cikk&kod=2001-07-it-Nyiri-Virtualis, accessed 1 March 2007)
OECD (1994): *Frascati Manual* (Paris, OECD Publishing)
OECD (1997): *National Innovation System* (http://www.oecd.org/dataoecd/35/56/2101733.pdf, accessed 12 July 2007)
OECD (1998): *Technology, productivity and job creation. Best policy practices* (OECD Publishing, Paris)
OECD e-Government Studies (2005): *e-Government for Better Government* (OECD Publishing, Paris)
OECD & Eurostat (2005): *The Measurement of Scientific and Technological Activities. Oslo Manual. Guidelines for Collecting and Interpreting Innovation Data* (OECD Publishing, Paris)
O'Reilly, Tim (2005) *What Is Web 2.0. Design Patterns and Business Models for the Next Generation of Software* (http://www.oreillynet.com/pub/a/oreilly/tim/news/2005/09/30/what-is-web-20.html, accessed 13 July 2007)
Örkény, István (2006): *More One Minute Stories* Transl. Judith Sollosy (Corvina, Budapest)
Paliwala, Abdul (2006) Changing Paradigms of the E-Communication, Governance and Learning (in: *Journal of Information, Law and Technology* 30 January 2006)
Papert, S. (1993): *The Children's Machine: Rethinking School in the Age of the Computer* (Basic Books, New York)
Perelman, Lewis J. (1992): *School's out. A radical new formula for the revitalization of America's educational system* (Aron Books, New York)
Perelman, Lewis J. (1993): School's Out. The hyperlearning revolution will replace public education (*Wired Digital* 03/04, http://www.wired.com/wired/archive/1.01/hyperlearning.html, accessed 17 March 2007)
Pintér, Róbert (2004): *A magyar információs társadalom fejlődése és fejlettsége a fejlesztők szempontjából* (PhD dissertation, ELTE Budapest, Manuscript, http://www.artefaktum.hu/Pinter_PhD_v2.pdf, accessed 14 July 2007)
Postman, Neil (1990): *Informing Ourselves to Death* (Speech was given at a meeting of the German Informatics Society, 11 October 1990, Stuttgart, Germany, http://www.mat.upm.es/~jcm/postman-informing.html, accessed 11 July 2007)

Pukánszky, Béla – Németh, András (2001): *Neveléstörténet. A reformpedagógia fejlődésének harmadik szakasza (1945-1989)* (http://magyar-irodalom.elte.hu/nevelestortenet/10.05.html, accessed 14 March 2007)

Putnam, Robert D. (1993): *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton University Press, Princeton N.J.)

Putnam, Robert D. (2000): *Bowling Alone. The Collapse and Revival of American Community* (Simon and Schuster, New York)

Putnam, Robert D. (2002): Bowling Together (in: *The American Prospect,* Vol 13.)

Rab, Árpád (2005): Néprajz az információs társadalomban (in: *Mindenes Gyűjtemény* II. Artes Populares 22. Budapest 357-371)

RAFT Network, The (2007): 5 years of distance continuing medical education and tele-consultations over the Internet in French-speaking Africa (in: *International journal of medical informatics* 2007/5-6)

Raschke, Carl (1998): *Digital Culture, The Third Knowledge Revolution, and the Coming of the Hyperuniversity* (in: Syllabus, March 1998)

Raschke, Carl (2002): *The Digital Revolution and the Coming of the Postmodern University* (Routledge Chapman & Hall, New York)

Rawls, John (1971): *A theory of justice* (Oxford University Press, Oxford)

Reding, Viviane (2005): *Citizens first – the next wave of government services online* (Video recorded speech, Paris, 13-14 December 2005)

Reding, Viviane (2005): *i2010, The European Commission's new programme to boost competitiveness in the ICT sector* (Microsoft's Government Leaders Forum, Prague, 31 January 2005, http://europa.eu.int/rapid/pressReleasesAction.do?reference=SPEECH/05/61&type=HTML&aged= 0&language=EN&guiLanguage=en, accessed 12 July 2007)

Reding, Viviane (2006): *Strengthening the European Information Society: From Talk to Action i2010 Conference "Towards a ubiquitous European Information Society"* (Helsinki)

Reed, Chris (ed.) (2000): *Internet law: text and materials* (Butterworths, London)

Riga Ministerial Declaration in June 2006 (http://europa.eu.int/information_society/events/ict_riga_2006/doc/declaration_riga.pdf, accessed 13 July 2007)

Rogers, Everett M. (1995): *Diffusion of Innovations* (Free Press, New York, 4th edition)

Roszak, Theodore. (1994): *The Cult of Information: A Neo-Luddite Treatise on High-Tech, Artificial Intelligence, and the True Art of Thinking* (University of California Press, Berkley)

Sassen, Saskia (1991): *The Global City* (Princeton University Press, Princeton)

Sassen, Saskia (2000): New Frontiers Facing Urban Sociology at the Millennium (*British Journal of Sociology* 51: 143-159.)

Sawyer, Steve (2001): The Social Shaping of Technology (in: *The Information Society* 17:4, 303-304, http://dx.doi.org/10.1080/019722401753330913, accessed 6 April 2007)

Schement, J. R. – Curtis, T. (1997): *Tendencies and tensions of the information age* (Transaction Publishers, New Brunswick)

Second draft of roadmap: visions, scenarios and measures (draft version of 8 August 2006, http://www.egovrtd2020.org/, accessed August 2006)

Shapiro, Carl – Varian, Hal R. (1999): *Information Rules. A Strategic Guide to the Network Economy* (McGraw-Hill Professional, New York)

Shenk, David – Shapiro, Andrew L. – Johnson, Steven (1998): *Technorealism* (http://www.technorealism.org, accessed 11 July 2007)

Siemens, Georg (2005a): *Connectivism: A Learning Theory for the Digital Age* (http://www.elearnspace.org/Articles/connectivism.htm, accessed 1 March 2007)

Siemens, Georg (2005b): *Connectivism: Learning as Network-Crreation* (http://www.learningcircuits.org/2005/nov2005/seimens.htm, accessed 7 April 2007)

Siemens, Georg (2006): *Connectivism: Learning Theory or Pastime of the Self-Amused?* (http://www.elearnspace.org/Articles/Connectivism_response.doc, accessed 27 March 2007)

Siemens, Georg (2007): *Connectivismus blog* (http://www.connectivism.ca/blog/, accessed 14 March 2007)

Solove, Daniel. J. – Rotenberg, Marc – Schwartz, Paul M. (2006): *Privacy, Information and Technology* (Aspen Publishers, New York)

Spitzer, K. et al (1998): *Information literacy: essential skills for the information age* (ERIC Clearinghouse on Information and Technology, Syracuse, New York)

Stanforth, Carolyne (2006): Using Actor-Network Theory to Analyze E-Government Implementation in Developing Countries (in: *The Massachusetts Institute of Technology, Information Technologies and International Development,* Volume 3, Number 3, Spring 35–60. http://www.mitpressjournals.org/doi/pdf/10.1162/itid.2007.3.3.35, accessed 7 April 2007)

Stanovsky, Derek (2004): Virtual Reality (in: Floridi, L. /ed./ *The Blackwell Guide to the Philosophy of Computing and Information,* Blackwell Publishing, Oxford)

Statistics of Canada, OECD (2002): *Working Party on Indicators of the Information Society*

Szabó, Máté (2005): Kísérlet a privacy fogalmának meghatározására (in: *Információs Társadalom* 2005/2, 44-54)

Szakadát, István (without year): *A digitális kultúra és világháló mint alternatív nyilvánosság* (http://mokk.bme.hu/archive/nyilvanossag_2001/pdf/data/at_download, accessed 3 June 2007)

The Tavistock Institute, in consortium with the MENON Network and Netweffect (2007): *Status of e-inclusion, measurement, analysis and approaches for improvement* (http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/revised_topic_report_4_synthesis_recommendations_final.pdf, accessed 13 July 2007)

Tavistock Institute, in consortium with the MENON Network and Netweffect (2007): *Status of e-inclusion, measurement, analysis and approaches for improvement* (http://ec.europa.eu/information_society/eeurope/i2010/docs/studies/revised_topic_report_4_synthesis_recommendations_final.pdf, accessed 13 July 2007)

Taylor, R. S. (1979): Reminiscing about the future (in: *Library Journal* 104: 1871-1875)

Tocqueville, Alexis De (2000 [1835, 1840]): *Democracy in America* (translated and edited by Harvey Mansfield and Delba Winthrop, University of Chicago Press, Chicago)

Toffler, Alvin (1980): *The Third Wave* (William Morrow and Company, New York)

Toffler, Alvin (2005): *Strategies for Survival.* (An interview by Blake Harris and Bryan M. Gold, http://www.blakeharris.com/bh1/content/view/19/2/, accessed 11 July 2007)

Top of The Web. Survey on quality and usage of public e-services (November 2003) (http://europa.eu.int/information_society/eeurope/2005/doc/all_about/quality_usage_final_report_2003.pdf, accessed 12 July 2007)

Touraine, Alain (1969): *La societé post-industrielle* (Denoël, Paris)

Townsend, P. (1993): *The international analysis of poverty* (Harvester – Wheatsheaf, New York)

Toynbee, Arnold J. (1971): Hogyan válik az emberiség az általa létrehozott mesterséges környezet rabjává (in: *Válogatott tanulmányok,* Gondolat, Budapest)

Tönnies, Ferdinand (1957 [1887]): *Community and Society* (translated and edited by Charles P. Loomis, The Michigan State University Press)

United Nations (1987): *Report of the World Commission on Environment and Development* (General Assembly Resolution 42/187, 11 December 1987, http://www.un.org/documents/ga/res/42/ares42-187.htm, accessed 14 July 2007)

United Nations (2005): *World Urbanization Prospects: The 2005 revision* (Department of Economic and Social Affairs, Population Division, http://www.un.org/esa/population/publications/WUP2005/2005wup.htm, accessed 10 July 2007)

Urry, John (1999): *Automobility, Car Culture and Weightless Travel: A discussion paper* (Department of Sociology, Lancaster University, Lancaster http://www.comp.lancs.ac.uk/sociology/papers/Urry-Automobility.pdf, accessed 13 July 2007)

Verhaak, Frans – Wauters, Patrick (2003): *e-Government: Benchmarking the Availability Online Public Service in Europe* (eEurope+ International Workshop, Prague)

Verhagen, Plon (2006): *Connectivism: a new learning theory?* (http://elearning.surf.nl/e-learning/english/3793, accessed 30 March 2007)

Virilio, Paul – Lotringer, Sylvere (1998 [1983]): *Pure War* (Semiotext(e), New York)

Warner, Richard – Dinwoodie, Graeme – Krent, Harold – Stewart, Margaret (2006): *E-Commerce, The Internet and the Law, Cases and Materials* (West Group, Berkeley)

Wauters, Patrick (2006): *The Renewed EU eGovernment Benchmark Model Proposed* (The Impact of eGovernment in Europe conference – 13 September 2006 in Helsinki, Finland)

Webster, Frank (1995): *Theories of the Information Society (Routledge,* London and New York)

Wellman, Barry – Guila, (1999): Net Surfers Dont Ride Alone: Virtual Communities as Communities (in: Smith, M. A. – Kollock, P. /eds./ *Communities in Cyberspace,* Routledge London http://www.chass.utoronto.ca/~wellman/publications/netsurfers/netsurfers.pdf, accessed 13 July 2007)

Wellman, Barry – Anabel Quan Haase – James Witte – Keith Hampton (2001): Does the Internet Increase, Decrease, or Supplement Social Capital? Social Networks, Participation, and Community Commitment (in: *American Behavioral Scientist* 45)

Wellman, Barry (2001): *Computer Networks as Social Networks* (in: Computer and Science, Vol. 293. 2001.09.)

White, Leslie A. (1949): *The Science of Culture: A study of man and civilization* (Farrar, Straus and Giroux, New York)

Whittaker, Jason (ed.) (2004): *The Cyberspace Handbook* (Routledge, London, New York)

Wiener, N. (1948): *Cybernetics: or Control and Communication in the Animal and the Machine* (Technology Press, Boston, MA)

Wiener, Norbert (1950): *Human Use of Human Beings* (Da Capo Press, New York)

Wikipedia (2007): *MUD – Multi-User Dungeon* (http://en.wikipedia.org/wiki/MUD#_note-bartle-history-email, accessed 14 July 2007)

Wikipedia (2007): *Semaphore* (http://en.wikipedia.org/wiki/Semaphore_(communication), accessed 14 July 2007)

Wikipedia (2007): *Web 2.0* (http://en.wikipedia.org/wiki/Web_2.0, accessed June 2007)

Wilkinson, R. G. (1996): *Unhealthy societies: the afflictions of inequality* (Routledge, London)

Z. Karvalics, László (1998): Az információstratégiák kialakulása és jellemzői – Magyarország esélyei és lehetőségei különös tekintettel az EU-integrációra (in: *Mi a jövő?* OMFB-ORTT-HÉA, Budapest)

Z. Karvalics, László (2004): Információközösségek – Kísérlet egy fogalom megragadására (in: Nyíri Kristóf /ed./ *Mobilközösség – mobilmegismerés,* T Mobile, Budapest)

Z. Karvalics, László (2007): *Az iskola az információs társadalomban* (www.oki.hu/cikk.php?kod=nyitott-07-Karvalics-iskola.html, accessed 14 March 2007)

Zurkowski, Paul G. (1974): *The Information Service Environment: Relationships and Priorities* (National Commission on Libraries and Information Science, Washington, D.C.)

Key terms

Actor-Network: A heterogeneous network comprising human and non-human components where technological objects and their socio-political context shape each other and co-develop into socio-technical entities through constant interactions. [Actor-Network-Theory]

Age of atoms, age of bits: A descriptive metaphor used by Nicholas Negroponte, according to which industrial societies are determined by the physical environment (raw materials, material goods), in other words atoms, while information society is determined by the flow of digital information, i.e. the movement of bits.

Back-office: A back-office system serves the effective cooperation within or between public administration bodies.

Benchmarking: A research procedure suitable for the qualitative and quantitative comparison of the performance level of an intervention with one that qualifies as the best in a similar field. The method makes the analysis and correction of key processes, as well as the elimination of errors, possible. It also improves performance and the definition of targets. *Benchmarking* is an important tool for finding "best practice", which can also lead to higher performance befitting the targets aimed at.

Civil society: For the majority of authors dealing with the topic, "civil society" is understood as organisations that operate on a voluntary basis, serving to balance the relationship between the two poles of the individual and the state by infiltration. From a network viewpoint, it can be defined as the relationship-network of society which develops independently of the state, and its operation falls outside the sphere of influence of state/executive power.

Convergence: In the context of the information society the strict, originally mathematical sense of convergence is interpreted in two ways: on the one hand, it means the ability of various network platforms to provide basically similar services, and on the other hand, it is used to refer to the unification of consumer goods such as the telephone, the television and the personal computer. Convergence is a multifaceted phenomenon and besides information society it is used in politics, in regulation, in the area of services and markets, as well as in intersectoral associations and fusions.

Culture: The human race is unique in that it has culture. According to the most general and concise definitions, culture is a sum of all non-inherited information, and the sum of mankind's survival strategies.

Customer Relationship Management (CRM): This means all the methods, information technology applications and Internet access with the help of which a company is able to maintain relationships with their customer-base, within an organised framework.

Cyberspace: The term cyberspace is linked to William Gibson's book Neuromancer, published in 1984, and refers to computer networks and information resources accessible through them. Cyberspace was often used at the end of the 1990s as a synonym for the Internet.

Deliberative democracy: In the traditional conception of democracy, citizens play only a passive role as consumers, since they practice the right of democratic control mainly by voting. At the same time, they have almost no influence on determining the public good. In deliberative democracy, however, public debate plays a central role, which is usually centred on different ideas concerning the public good. In public debates, citizens express not only their existing ideas, but also formulate their point of view as a result of constant reflection.

Deprivation: Literally meaning 'poverty', the term is particularly powerful when used in the expression 'multiple factors of deprivation'. This implies that poverty / deprivation is caused by the combination of elements such as: economic distress, deficient schooling, inadequate housing, unemployment.

Diffusion network: Social networks through which innovations diffuse within a given social group. [Rogers' diffusion theory]

Diffusion of innovation: This term refers to the process characterising the spreading, adoption and consolidation of innovative tools and artefacts. In Molnar's theoretical model, diffusion patterns are shaped by a combination of three variables: the degree of penetration of technological innovation; the rate of growth, and the actual properties of the technologies themselves. The interaction of these three variables leads to three types of 'diffusion state': saturation; plateau; dynamic. (See "types of diffusion states").

Digital divide: In general terms, it refers to the gap between those with access to information and communication technologies (ICT) and those without. Initially the term was used to indicate those who had access to hardware (i.e. a Personal Computer) in comparison with those who had not. As technologies evolved and their use also changed qualitatively, the divide has been seen as separating users from non-users, and latterly, distinguishing different types of users. It is clear that there is not just one digital divide but multiple divides which relate to a variety of factors, such as: gender; age; 'ethnic clustering'; uncertainty of living/financial conditions; work insecurity, and social insecurity.

Digitalisation: The process during which works (texts, images, and sounds) originally published non-digitally are converted into an encoded form readable by computers. When texts are digitalised each character (letter, punctuation mark, etc.) is given a separate code; this is often complemented by commands about how the text is to be displayed.

E-inclusion or **digital inclusion:** refers to the conception that all citizens should have access to ICTs and should be able to make effective use of them.

E-portfolio: The function of the electronic portfolio (e-portfolio) is to compile in one place all the documents related to the studies of a student. The knowledge maps, learning diaries, solutions to problems/tasks, tutor- or self-evaluations, various links stored in wiki or assembled with the help of other knowledge management tools all promote the pooling/exchange of knowledge among people. Those participating in network learning can form an opinion concerning the previous knowledge of their partners, their sphere of interest and their style of learning on the basis of the e-portfolio, and this can help cooperative learning.

Electronic democracy: The use of interactive technologies in the interest of strengthening democratic processes, as a result of which people may feel they have more space in which to express their views and opinions, and they can be more active participants of democracy. In other words, exploiting the possibilities offered by the digital technologies to strengthen the relationship between citizens and the government, in order to improve the democratic processes between the governing power and those governed, between the representatives and those represented. Electronic democracy can be further divided into "electronic participation" and "electronic elections".

Electronic government: Using the combination of information technology, structural changes and new skills in public administration in order to improve the standard of public services, and make the

operation of public administration more simple, more efficient and more economical, and to further strengthen the democratic processes.

EU 20 services: The 20 basic public services defined in the eEurope 2002 ActionPlan (Common List of Basic Public Services – CLBPS). The online sophistication of these services is measured annually in every Member State of the European Union.

Ex ante: See "information society law".

Ex post: See "information society law".

Freedom of information: Public accessibility to data in order to ensure the transparency of state. Public data includes information in regard to activities performed by the state, local government or other public service organisations.

Front-office: A customer service and information technology system through which the IT back-office systems of public administration bodies are made accessible to authorised users.

Globalisation: refers to the increased interdependence and mutually exerted influence between countries and between human communities on a global level, which shapes economic, cultural and political subsystems.

Informal learning: An activity that is realized outside the framework of institutional organisations, aimed at promoting learning, and acquiring and applying knowledge.

Information: The term originates in Latin and has a complex meaning closely related to facts, the communication of facts, data, knowledge, learning, communication, news. In certain cases "information" appears to be identical with these concepts (e.g. fact, data, knowledge, news), in other cases it is the subject of the aforementioned notions (e.g. instruction, learning, communication). (The transformation of data into information requires knowledge, whereas its conveyance necessitates communication.)

Information literacy: Te ability to access information and use it to create value. Someone can be regarded as information literate if he recognises when he needs information, and if he has learnt how to learn.

Information society: A new form of social existence in which the storage, production, flow, etc. of networked information plays the central role. (There are several other definitions of the concept.)

Information society approaches: Research principles of social sciences originating from the 1960s and 1970s which offer different explanations to the reasons leading to the development of information society and accounts of its major features (technological, occupational, economic, spatial, cultural).

Information society law: A group of laws that includes the protection of personal information and the freedom of information. The sum of regulation governing social relations built on communication networks. We can differentiate between two kinds of regulations of the information society: either the legislator attempts to regulate the anticipated developments of interactions in advance, which is called *ex ante* regulation, or alternatively waits to see how these processes will develop and retrospectively regulates them, this latter approach is called *ex post* regulation.

Information society studies: An area of science that emerged in the 1990s for the systematic study of information society issues and its "translation" into higher education curricula.

Information strategy: A new stage of high level political planning that emerged in the early 1990s, uniting areas such as the development of information infrastructure, the informatisation of the key subsystems of society and the development policy for the information industries. Functioning as a framework for social planning that determines the programme of building the information society, it includes visions about the future, outlines a comprehensive view of society, has long-term aspirations, and presupposes a consensus between the players of the political elite regarding the future attainment of a desired social quality. It prescribes the controlled concentration of resources. It regards education as the main sector where competitive advantage can be achieved and therefore considers it as a priority of national prosperity.

Innovation: The implementation of a new or significantly improved product (goods or service), or process, a new marketing method, or a new organizational method in business practices, workplace organisation or external relations.

Interactive services: Services that go beyond simply offering information – downloadable forms, search systems, thematic guides that require the active participation of the customer.

Interconnectivity: On the one hand, the concept that, within dynamic systems such as biological entities, economic systems or societies, the changes between connecting subsystems mutually affect one another; on the other hand, the development of mutually connected information and communication systems.

Internet filtering: The application of software restricting access to Internet contents, depending upon various settings (URL, words, images, etc.).

Interoperability: The ability of systems to cooperate with one another. Interoperability can be:

- technical, concerning the necessary standards for the cooperation of systems
- semantic, concerning the standardisation of the description of concepts and objects
- political, human, concerning the disposition of resources
- between communities, concerning the distribution and common use of resources
- legal
- international

Interpretative flexibility: refers to the flexible nature of discussed and debated meanings ascribed to scientific results, engineering processes and the resulting technologies by relevant social groups within a certain social context. [Social Construction of Technology, SCOT]

Learning management programs (e-learning framework systems) (Learning Management Systems, LMS): Learning management programs based on the Internet contain the following functions:

- Keep a record of the learners and their results.
- Keep a record of applications to courses and exams.
- Give access to the various materials and elements of the courses.
- Keep a record of the activities of the users: teachers and students.
- Usually provide the primary communication interface.
- Endeavour to increase student activity with automatic functions.
- Support the teacher's evaluation/assessment (both formative and summative evaluation).
- Contain elements of self-evaluation and accountability.
- Inform users of the latest news concerning education.
- Support the realisation/arrangement of web-lectures and web-seminars.
- Support the work of virtual groups and provide a collaborative platform.

Lifelong learning: The concept of lifelong learning focuses on the development of a new culture of learning and the dissemination of competency-based education. It encompasses the whole life cycle of the individual, from early socialisation and pre-school education to the post-active age (from the point of view of employment). Its objective is to guarantee access to learning for everyone, and includes forms of learning that are outside the school. Apart from learning within the formal framework of school systems, it regards personality-building experiences taking place in any other area of everyday life (for example through the media), at the workplace or in the family, as learning.

Linear service: An audiovisual media service provided by a media service provider for simultaneous viewing programmes on the basis of a programme schedule.

Marketing innovation: The application of new marketing methods, during which changes are introduced in product design, packaging, the launch of a product onto the market, product advertising and pricing.

Multitasking: In computing this term is used when a computer seemingly runs several programs and tasks simultaneously. "Media-multitasking" is the simultaneous use of more than one

communication channel, e.g. if someone uses the Internet while watching television or listening to the radio. Human multitasking involves a person simultaneously carrying out more than one activity.

National Innovation System (NIS): The network of institutions in the state- and private sectors the activities and interactions of which initiate, import, modify and disseminate new technologies. The main objective of NIS analyses is to assess and compare the channels of knowledge flow as well as to identify bottlenecks. In this way economic policy can intervene where necessary and ensure the uninterrupted flow of knowledge. In a simplified way, what is under examination is the role of relationships in scientific and technological development between industry, R+D and the government.

Network: Every system that is made up of separate elements connected to one another can be considered to be a network. Social networks are formed from relationships between the participants forming a society.

Network economy: The economic system of information society. The attribute "network" signals that the creation of products and services – the actual creation of values, takes place in networks.

Network node: The smallest building unit of the network is the network node. In collective networks, we consider individual acting agents as network nodes, while in computer networks, this is what we call the individual computers connected to the network.

Network society: A social form based on the production, processing and transmission of information. The basis of its operation is ensured by the network of modern information and communication technologies.

Network state: A complex institutional system in which different local, regional, national and supranational decision-making levels are combined.

On-demand service: A non-linear audiovisual media service provided by a media service provider for the viewing of programmes at the moment chosen by the user and at his/her individual request on the basis of a catalogue of programmes selected by the media service provider.

Open Method of Coordination (OMC): Links governmental and non-governmental players, providing them with joint objectives and a means to encourage them to share their experience and to cooperate in working out solutions and necessary measures.

Open source code: This expression applies to software where the source code is either public property, or, more often, the owner of the copyright distributes it under a licence that complies with an 'open source' definition. This type of licence may, for example, prescribe that the source code must be distributed along with the programme, and that it may be modified freely (or at least with minimal restrictions).

Organisational innovation: The implementation of new organisational methods in a company's business practices, workplace organisation or external relations.

Output-control: In a pedagogical sense, output-control means that it is the desired learning (competency) aims that are defined, and not the input content, broken down into a detailed syllabus divided into time-units. Choosing the individual route leading to these aims depends on the previous knowledge of the individual and on the various time demands. In this system, the output is uniform and the input is different.

Personal data protection: The protection of any data relating to a specific natural person, ensuring the right of self-determination over data processing about them. The expression privacy used in Anglo-Saxon legal systems covers a wider spectrum: it means the protection of the private sphere from the outside world. In these legal systems euthanasia and abortion come under the scope of protection of privacy among other things. The expression "data protection", used in continental legal systems, is a part of the protection of the private sphere.

Post-industrial society: This term was the most frequently used one before the expression "information society" gained overall acceptance; it defined the newly emerged social-economic phenomenon by emphasising the fact that the old structures of the industrial era were replaced by new ones rather than by focussing on its "content".

Presumptive anomaly: based on scientific calculations, system builders anticipate such future changes – that a technological system becomes inoperable or uncompetitive compared to a new and more effective system. As a result, the course of research and development can take a completely different path. [Systems approach to history of technology]

Process innovation: The application of a new or significantly improved production or transportation method; innovation of a technological type.

Product innovation: the implementation of a new or significantly improved product or service.

Relevant social groups: The members of such groups shape the development of a technology. They may be individuals, organisations or institutions. All other groups organise around these groups if they consider technology related problems relevant. [Social Construction of Technology, SCOT]

Research and development (R+D): Regularly conducted creative work aimed at expanding the existing body of knowledge, including the knowledge formed about man, culture and society, as well as at using this body of knowledge in order to develop new uses. R+D incorporates three types of activities: basic research, applied research and experimental development.

Reverse salient: An anomaly in the growth phase of technological systems. It occurs when a conservative innovation of a component makes another formerly functional component (physical or non-physical) inoperable. If it cannot be corrected by conservative innovations – a radical innovation is needed to foster a new technological system. [Systems approach to history of technology]

S-curve of adoption: Refers to the diffusion pattern characterising the introduction of a new technology; it shows a slow start, then a steep rise, and then a slow progress again. It implies that the adoption of a new technology goes from the bottom of the curve, where there is a long period of research and attempts to address the market, and then it suddenly takes off when the market is ready and willing to adopt it.

Scale-free network: A network in which there is a small number of nodes with many connections, as well as a large number of nodes with few connections. The majority of community networks belong to this category. When analysing the "links" pointing to one another on homepages on the Internet, we come across similar, scale-free network connections.

Self-regulation: An independent system of rules that take into consideration the norms applicable in sectors of business life, like chambers of commerce and associations.

Social capital: Several definitions of social capital are known, but a common characteristic of all of them is that the concept is connected to social networks in which interactions, preferences and friendly attachments related to the everyday life of people develop. By social capital, we mean non-material resources resulting from relationships between players who constitute the networks, and influence the social and economic processes taking place on the different (e.g. family, neighbourly, settlement, national) community levels of social cooperation.

Social exclusion: This term refers to the condition of individuals who are not active members of the society they live in. It is assumed that this social phenomenon is caused by a number of inter-related factors including low income; labour market exclusion (linked to ill-health, low educational attainment and lack of skills); access to education and learning opportunities; housing status; degree of social capital and neighbourhood status, linked to the reinforcement of 'cycles of poverty'. These factors tend to occur commonly across many western societies.

Social inclusion: denotes the opposite situation to 'social exclusion'. In other words, it implies that individuals or groups are active within the society they live in, with the potential to access available educational, professional, economic and/or political opportunities.

Social informatics: A strongly interdisciplinary research field exploring the meso- and micro levels of information society and the social issues pertaining to telecommunication and computing.

Social resistance: can occur when radical innovations are introduced. It can delay or halt the diffusion of a given technology. On the other hand radical innovation can change the dominant values and lifestyles in society. [Evolutionary history of technology]

Social software: Social software is a relatively new collective term, encompassing applications which make the cooperation and communication of different individuals or groups possible. The simplest and most evident examples of this are the e-mail, the *Instant Message* (IM) programmes and the diaries (blogs) posted on the World Wide Web. Social software that has been properly used promotes communication between users and network connections, contributes positively and effectively to the accumulation of social capital, and through investments in information and communication technologies (ICT), they may even serve as a key to increasing productivity.

Sociometry: J. L. Moreno's method of investigation, which shows the structure of the network with the help of mapping the hidden choices within communities. Sociometry is typically used to reveal the problems of small communities such as school classes, or groups working together in departments at work.

Supernarrative for development: An interpretative framework for the development of society, a focus for political discourse and a specific worldview which guides decision-makers in setting the direction for the development of society.

Technological determinism: argues that technology is the principal driving force in society determining its mode of operation, development, course of history, structure and values in a decisive manner. The effects of any opposing direction are taken into account to a limited extent, fully disregarded or disclaimed. Technological development is thought to be propelled by the logic of science alone.

Technological momentum: Components of a system (especially capital intensive ones with a long amortisation period) move in the same direction following certain goals along a specific trajectory. Technological momentum can move a system forward that has already lost its functionality. That is why technological stasis (the end of evolution) can be delayed. [Systems approach to history of technology]

Technology transfer: The process during which ideas and techniques generated in one area are applied in another area.

Technophilia: is enthusiasm for technology, which expects and perceives only positive social changes from technological development. Ideologically it originates from liberal-progressive traditions.

Technophobia: The opposite of technophilia. Aversion to and fear of technology and its negative implications for society. Technophobes expect and perceive only negative changes and anticipate a dystopian society.

Technorealism: makes efforts to assess the social impacts of technology objectively taking into consideration positive and negative effects.

Time-space compression: A term coined by David Harvey. The development of transportation technology and the increasing role of the media bring about a decrease in the importance of physical distances and the time needed to bridge them.

Translation: is the constant shifting of power between technology and society, and between entities of the network. [Actor-Network-Theory]

Types of diffusion states: In Molnar's theoretical model, *saturation* refers to the situation where penetration is practically complete and growth is stagnant; *plateau* refers to the situation where penetration is very high but not complete and growth is low or oscillating; *dynamic* refers to the situation where penetration is lower but increasing and growth is very high.

Virtual reality: Real or imaginary worlds simulated by computers. The term can be used for graphic- and text-based computer-generated worlds. Virtual reality is closely linked with the development of 3D computer representation; special software and hardware is often used to achieve 3D effects (e.g. VR glasses).

Web 2.0: The expression "Web 2.0" designates second-generation Internet services based primarily on the activity of online communities, more exactly on the user generated contents (UGC) and on sharing these contents (e.g. blogs, wikis, etc.).

White collar revolution: Jean Gottmann used this expression for the title of chapter 11 of his book Megapolis, published in 1961; it is the first analytical description of information society.