

Living in the European Ubiquitous Society*

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The times they are a-changin'
– Bob Dylan, USA 1964
Hard Rock Hallelujah
– Lordi, Europe 2006

Introduction

In June 1, 2005 the European Commission adopted the initiative "*i2010: European Information Society 2010*" to foster growth and jobs in the information society and media industries. According to the Commission *i2010* is a "comprehensive strategy for modernising and deploying all EU policy instruments to encourage the development of the digital economy: regulatory instruments, research and partnerships with industry. The Commission will in particular promote high-speed and secure broadband networks offering rich and diverse content in Europe." ¹

The Commission set three priorities for Europe's information society and media policies:

- i) the completion of a Single European Information Space which promotes an open and competitive internal market for information society and media;
- ii) strengthening Innovation and Investment in ICT research to promote growth and more and better jobs;
- iii) achieving an Inclusive European Information Society that promotes growth and jobs in a manner that is consistent with sustainable development and that prioritises better public services and quality of life.²

The European Information Society Conference "*i2010 – Towards a Ubiquitous European Information Society*" was held in Espoo, Finland, on 27-28 September 2006, arranged by the Finnish Presidency of the European Council and the European Commission.³

* Some notes from the i2010 conference (Dipoli, Helsinki, September 28, 2006).

"Mobile services will be the fastest developing sector of the communications market".

– Susanna Huovinen, minister, i2010

In her opening words minister Susanna Huovinen described the i2010 conference as follows:

"This conference continues the EU tradition of information society conferences, the main aim of which is to explore the challenges posed to European policy. We have also invited guest speakers and participants from outside Europe in order to give a truly global perspective to our topics. Today's conference is also special, because we have both communications experts and transport experts taking part in the discussions." (i2010 conference)

According to minister Huovinen the purpose of making the Presidency Conclusions is to prioritise the various actions that need to be taken. These conclusions should help to guide the implementation of the EU's i2010 strategy during the German Presidency.

The Ministry of Transport and Communication of Finland asked the author of this article to take part in the i2010 conference as an outside observer, and to write his own interpretations of the themes and discussions of the conference from the point of view of a futures researcher.

Accelerating Change of Technology – What About the Future

"Inventions have long since reached their limits, and I see no hope for further developments"

– Roman engineer Julius Sextus Frontinus, 10 C.E.

"Technology advancement will not stop"

– Naoyuki Akikusa, Fujitsu, i2010 conference 2006

In the i2010 conference Matti Lehti, executive chairman of TietoEnator, stated that what we are experiencing now, what digitalization is bringing to us, is the *third industrial revolution*. Electrifying society took some 50 years, and Lehti estimated that digitalization may take perhaps 25 years only. So, modern European societies would have experienced that phase by 2020 or so. Lehti's assessment fits reasonably well into a somewhat more general framework below. We may describe the continuum of technological revolutions as follows:

I Steam engines 1780-

- railways
- industrial manufacturing
- agricultural machinery

II Electric power 1890-

- combustion engine
- road traffic
- industrial automation

III Information and communication technology 1975-

- microprocessor and PC
- communication
- Internet
- automation in knowledge work

IV Bio, material, nanotechnologies 2025-

- DNA-chips, routine screening
- Gene passports
- Gene therapies
- Genetic enhancement
- GMO

V Fusion technologies ??-

- generic technologies
- mechanics, computing and communication power, organic elements in one technology.

The ideas of the fourth and fifth revolutions are naturally hypotheses only. In any case, contrary to what engineer Frontinus maintained 2000 years ago and more in the line of thinking of Mr. Naoyuki Akikusa from Fujitsu Ltd., there are no signs indicating that the megatrend of technological change would stop. More probable than even slowing down is that technological developments will be accelerating in the future.⁵

Table 1
Brief History of Accelerating Change

100,000 generations ago	speech
750	agriculture
500	writing
400	libraries
40	universities
24	printing
16	accurate clocks
5	telephone
4	radio
3	television
2	computer
1	Internet / e-mail
0	GPS, CD, WDM

When looking at the brief history of accelerating change from the table 1 one can see that many of the technological inventions and innovations, which are most labelling to the life of modern societies are not older than five human generations.⁶ At the same time, when many if not most people, are longing for ever higher standard of living, more advanced technological devices and wider selections of high-quality contents and services, they also implicitly push forward more technologically-loaded development in the future. As a consequence this development leads to increased

complexity in technological, economic and societal systems setting high demands on what could be called our capability for systems intelligence.

Ubiquitous Information Society as a Part of a Bigger Framework

As a concept the ubiquitous information society is fairly new. When the Commission launched its initiative "i2010 – A European Information Society for growth and employment" just a little more than a year ago, it didn't use the word 'ubiquitous' at all. Mark Weiser from Xerox company used the expression ubiquitous computing in 1988, meaning computing technology, which is invisible, embedded into its surroundings and 'everywhere'.⁷ Ubiquitous network society can be defined as being a society, where wireless data transfer and networking is possible for anyone, any place and whenever using different devices.

In order to understand the 'bigger picture' of what is it all about in the ubiquitous information society and what may be happening in the future, a broader framework is needed. In the figure 1 a general evolutionary scheme of the big waves of technological and societal changes is presented.⁸

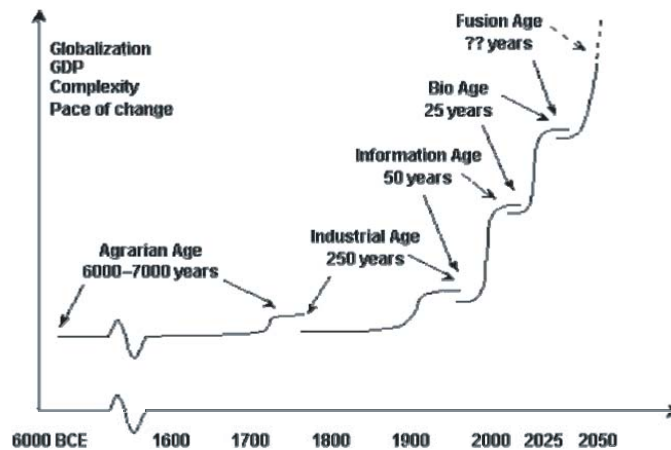


Figure 1. Big waves of societal change

Names of the different eras in figure 1 are based on dominating or labelling technologies of each epoch. There are three especially important features worth to be pointed out. First, pace of change in development is intensifying. The agrarian age lasted for thousands of years with a pretty stable technological base. Through technology-driven societal changes the western countries entered the era of industrial societies, which lasted only some hundreds of years. Our time, the age of information societies, may have a lifespan of just a few decades.

Second important characteristic is a tendency towards growth or rise of levels. In the vertical dimension globalization, GDP, complexity and pace of change are mentioned. You could add to them e.g. urbanization, which is a global phenomenon. This

is not to say that they are deterministic phenomena in the same strict sense as in natural sciences, but until now they have been strong tendencies, megatrends of our times. And even though there is no natural law against it, it is highly improbable that for example globalization would stop in the next month.

Every new societal wave includes all the previous ones. This is the third and perhaps the most important feature in this evolutionary framework, and it has to do with the idea of emergence. Significant technological changes bring quite new emergent features to the society, to its economy, consumption patterns, societal innovations, etc. For example Fujitsu, Nokia, Microsoft, France Telecom, F-Secure and Amazon.com are operating in economic fields, which the industrial society of the sixties was simply lacking. Computers, software business, mobile phones, networks, security and e-business are clearly emergent features of the information age.

At the same time information society includes the essential features of the industrial society. We are actually more industrialized now than then, producing more industrial artifacts (cars, pins, airplanes, etc.) and doing it with increased productivity. We still have the most important features of needs satisfaction even from the age of the agrarian societies: we do not eat information but meat and potatoes.

After the information age, what comes next? One hypothesis is biosociety. This idea, again, is based on the expected labelling technologies of the new era: biotechnologies, material and nanotechnologies. Biosociety will be more complex, more advanced and more promising, it poses more threats and ethical issues than the information society. It is important to note that the biosociety is a much more developed information society than the one we are experiencing at the moment in the most technologically advanced countries.

The concept of fusion society in figure 1 is based on the idea that in the very long time perspective convergence trend in ICT will become generalized into *fusion technologies*, and in the future it does not make sense to use the old categories of different technologies anymore. Essentially all technologies will merge into a systemic totality having expressions and applications in different forms in different spheres of life, different economic and social arenas and in the endless multiplicity of everyday life.

From technology-push to people-pull

The primary driving force in the information society until the new Millennium has been technology. The development of content has been in a secondary role. Nowadays production of content will ever more be the primary driving force. The future will be featured by the applications and people's needs.

In many European countries, the USA, Korea and Japan it can be noticed that the applications are already the driving forces in the development of technology. People are expecting that technology will satisfy their needs and provide them with services. Consumers are not satisfied with buying a mobile phone only. They make buying decisions depending on the provided services; so technology as such will be an issue of second order. As Commissioner **Vivian Reding** put it in the i2010 conference, people do not buy technology per se, but they pay for services, which they can get using technology.

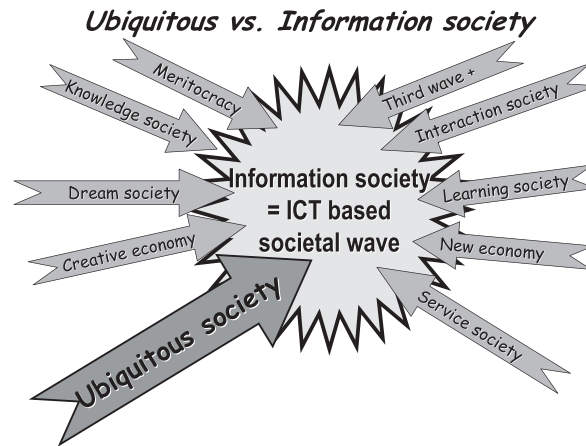


Figure 2. Different approaches to the information society

This new phase of the information society could be labelled as *information society part two*. Several perspectives to think of the nature of the present and the near-term future information society have been presented. Examples of them are Learning society, Knowledge society, New economy, Service society, Interaction society, Third wave, Meritocracy, Creative economy and Dream society. Many of them are overlapping, some live longer as concepts (information society as such), others have shorter lifespans (like fashionable talks on new or creative economies).

Ubiquitous information society is one of the most important approaches to the future development of the information society.⁹

Ubiquitous Society – Some Brother is Coming

*"A human being never loosens her demands
on the level of technology – it can only be
better in the next year"*

In the ubiquitous information society intelligence will be everywhere. In the tyres and control centre of a car, walls in a house, meat packages in a shop, motorist suit, teddy bear, lift ticket in a skiing centre, pillbox of a grandmother, and in numerous other places. In addition to being intelligent, objects in a ubiquitous society are able to communicate between themselves (object to object communication; O2O). One can speak of the 'Internet of things' (as in the presidential conclusions mentioned earlier). There is naturally the other types of communication, too, person to person (P2P) and person to object (P2O) communication.

Artifacts and machines of everyday life as well as in economic and societal activities communicate wirelessly between themselves and control their own activities autonomously. A washing machine tunes its parameters itself based on the quality of the fabric and on how dirty is the laundry put in it. Information system of a communal

health care centre automatically knows whether an elderly person living at home has taken her night medication and is her heart still beating or not. A broken copying machine calls for a repair man, and an injured turbine in an aircraft makes an order for a spare part to the next airfield.

Ubiquitous development will have a significant impact on human work and everyday life. One important and obvious aspect of it is that ubiquitous society means development towards an unforeseen "Some brother controls, knows and never forgets" society. 'Some brother' is not the same as George Orwell's 'Big Brother' in his book 1984. In Orwell's world Big Brother was the core of a totalitarian system, which purposefully controlled the citizen's life. It had a mission. Some brother is not a single player, but a whole, which consists of societal players like public sector authorities, citizens' movements and NGOs, economic players, big global companies and SMEs and finally all of us as citizens. Big brother had one address, Some brother has several of them, of which some are visible, some are not.

Ubiquitous Some brother development may lead us to a society of "gentle control, comprehensive knowledge and eternal memory" without any one player being in total control of the development. Other scenarios are possible, too, in case that one player (eg. powerful global market forces) gains overly great power in the development.

Thus the three key features of a ubiquitous society are control, knowledge and eternal memory.

Control

Already citizens leave an increasing amount of traces and information behind them. Our mobile phone signs all the time, where we are. Someone knows, when we call or send a text message, at what time it happened, to whom did we call, etc; when surfing the Internet, or e-mailing, traces are left behind us. Surveillance cameras are everywhere, in shopping malls, streets, and highways.

Traffic is a good example. In the i2010 conference both minister Susanna Huovinen and director general Fabio Colasanti pointed out the great promises of the intelligent car and automated transport systems. ICT is a key factor for enhancing road and vehicle safety. Colasanti reminded that every year we lose 40.000 human lives in traffic accidents in Europe. It is a size of a small town. ICT improves the competitiveness of many industries through enabling them to have more efficient transport services. It is even the main determinant in decreasing environmental harm caused by traffic.

One everyday consequence is that already in the near future car drivers should think that, if they are speeding, it is not only probable that they will get caught, it is a certainty. In the longer-term future the automated control systems will take over driving an intelligent car in a highway, and the driver turns into a passenger, hopefully in a safer and cleaner traffic environment. Drunk driving will become history.

What happens to shoplifting, when everyone in the society knows that if you do it, you will always get caught? Some brother is watching. And the same speculation goes to many other crimes as well.

A couple of more examples of ubiquitous control should be given. You cannot forget you eyeglasses on the table of a café. If you try to, they will start yelling, or

maybe they simply fly onto your face after you have walked away from them five meters or so. Intelligent toilet bowl makes an instant health diagnosis of you, and alarms ambulance, if needed. The possibilities for ubiquitous intelligence in controlling us are huge in the future.

One should not forget the whole sphere on making political, administrative and economic activities more transparent in a ubiquitous society. Citizens are able to control the activities of their leaders in much more effective and versatile ways and in real time in the future. Ubiquitous information society has the potential to promote democracy.

In a transparent ubiquitous society people live aquarium life. It is up to us, the citizens to carry out constant ethical discourse on who or what is allowed to watch our aquarium, from what distance and from what angle. Concerning those issues, in political and societal processes at different levels, in the European Union, and at the level of the state and the municipality, people will make decisions and regulations, which are always temporary.

Knowing

An increasing amount of knowledge is flowing between different information systems and accumulating in growing and evermore intelligent databases. Shopping mall does have a sharper picture of what are our profiles as consumers, than we do ourselves. Virtual bookstores, like Amazon.com, make proposals based on our earlier shopping behavior. Often they are pretty good ones.

Already at present the questions of privacy have become more and more important in modern information societies. In the future the ubiquitous information society has an increasing amount of important and delicate genetic information on individuals in addition to all the other already existing information belonging to the domain of privacy.

Eternal memory

Ubiquitous society never forgets. This phenomenon may have many implications in the future both at the individual and societal levels. Sometimes human beings need to forget some unpleasant issues in order to be able to move on with their lives. In the past, if something sad had happened, people could move to another city and start anew. It is not possible anymore in a ubiquitous information society. *Reconstructing our lives* in a detailed way is easy already now, but it will be even easier in the future.

It should be emphasized that the features of the ubiquitous society – control, knowing, eternal memory – just described are mostly well-meaning endeavours of the Some brother. Attempts to harm and make crimes using the technological possibilities of the ubiquitous society are another issue and also very much possible in the future.

The Question of Real and Virtual

Naoyuki Akikusa made an important comment stating that we are in a turning point in the relationships between the 'real' world and the 'net' world (Figure 3). So far,

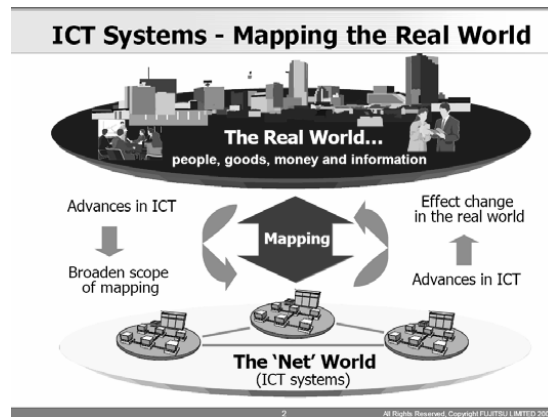


Figure 3. Mapping the real world, Akikusa 2006

the main issue has been the ability to map the real world into the virtual net world. Now, and increasingly in the future, the opposite is the key to corporate and national competitiveness, said Akikusa. The question is, how the constantly developing and complexifying (virtual) net world effects changes in the real world. And of course, which public and private players are effective and competitive in this at the global and other levels.

In the ubiquitous society making sense of what is real and what is virtual may become more and more difficult in the long run, and in the very long run it possibly doesn't matter anymore. "What is real, what is virtual, big deal!?", said a youngster in 2016. Real and virtual will merge into one complex systemic totality.

One important phenomenon, which is already here, is surfing in the real world. Google Earth is one well-known example of this.¹⁰ It can be used for watching more or less detailed pictures from all over the world taken by satellites. All you need is an Internet connection and a web browser. Looking at Manhattan, for example, you can zoom the pictures in so clearly that you will see single cars in the streets.

It is not difficult to sketch out the future perspectives in this respect. In the not-so-distant future we are able to watch real time moving picture from anywhere in the world, from Ulan Bator, Kilimanjaro, San Francisco Bay or even from the headquarters of the EU in Brussels. And we can do it by using our mobile communicator (mobile personal digital assistant, MPDA) whenever and wherever we happen to be. Surfing in the real world will have a significant amount of uses in the economy, society and in our private lives. It can help the authorities in monitoring the state of the environment, carrying out the tasks of the police, fire and rescue departments, and us private citizens eg. in planning the next holiday trip.

Merging real and virtual worlds will become routine in the future. One example, which already had these kind of features, was the TransVision2006 conference of the transhumanists in Helsinki in August 2006. What happened in the real world in real space in a conference room in Helsinki could be followed in an island called Uvvy. Uvvy is situated in Second Life virtual world ("metaversum"), and it is an island of the transhumanists. In Uvvy there is a virtual conference centre on the walls of which

one could see the happenings in Helsinki. Virtual creatures in the island could discuss the topics of the conference, and comment on them to each other and to the "real" conference. Participants of the conference in Helsinki, on the other hand, could follow the happenings in the Uvvy conference centre from the screens in the conference place. One can ask, what was "real" in this event in the sense of thinking and creating ideas and innovations.¹¹ And does that question have any real meaning?

Didier Lombard, CEO of France Telecom, thought that technological convergence of the ICT is a revolution comparable to that of Johannes Gutenberg's (1398-1468) invention of technology of printing with movable types during 1447. In a similar way as Gutenberg's technology helped to distribute information to a wider public instead of small circles of monks only, modern technological convergence is leading to effective sharing of information in many forms – text, pictures, photos, videos, music – among large groups of people globally. The culture of blogs (in France there are eight million blogs, written mostly by young people) combined to the mobile television technology will be essential parts in this revolutionary process (besides Lombard some other speakers, eg. Minister Huovinen seemed to have high expectations concerning the mobile television¹²). Lombard noted that personal content is becoming more important than professional content in this new culture. As an example one could add that it is estimated that in 2005 the American people spent more time in reading blogs than the mighty newspaper New York Times.

"In the future, everyone will be world-famous for 15 minutes"

– Andy Warhol, 1968

"In the future 15 people will be famous"

– Andy Warhol, after 1968

"In 15 minutes everybody will be famous"

– Andy Warhol, after 1968

Paradoxical but true, now and probably even more so in the future: Andy Warhol was right in all these statements! Thanks to the new virtual world with ubiquitous intelligence, we all can get our moment of fame everywhere in the world (we are ubique!). Only a very small group of people, like Madonna, however, can be really mega-famous. And due to the speed of modern ICT, in the next fifteen minutes a lot of things can happen – for example we may establish a new global political movement.

The youngsters already live in the 'other' reality. A strong signal of the future is how young people spend hours in a day in some virtual cosmos playing games, chatting or doing something else. Korea's C generation is a good case example. Generation C (born 1988-) is the cohort "who attach great importance to contents and creativity, dream of becoming a celebrity, love to take photos with digital cameras and are open to social and technological changes."¹³ The letter C stands for a broad range of concepts including creativity, contents, control, celebrity, camera and change. Members of Generation C can produce, display and distribute to millions of Internet users worldwide their own images, creations and contents via blogs, the proliferating online personal showrooms. Trendwatching.com describes the emergence of Generation C in Korea in the following way:

Witness how millions of professionals... occupy blogland, sharing their insights and creative achievements with an ever growing audience, while many younger members of Generation C choose to open up their own showrooms on younger and funkier platforms like Cyworld... this South Korean phenomenon now provides more than 10 million South Korean citizens (25% of the entire population) with their own cyber-outlet, where self made poems, stories, songs, photos, videos and what have you can be shown off to other Gen C members and producers, agents, talent scouts and employers alike. ... users can liven up their space with funky digital decorations, or spice things up with videos and music, bought with acorns, Cyworld's currency.¹⁴ (Park & Seo, 2006, pp. 180-190)

Having material affluence and technological skills with creativity, Generation C increasingly could afford to access professional hardware, software, and online distribution channels, enabling them to show images, sound, and video in ever more powerful ways. Moreover, Generation C began to create their own personal media by using various technologies and methods. Interestingly, Generation C tends to use their personal media mostly to have fun and entertainment, rather than use it for acquiring information and knowledge. More significantly, the frequent utilization of image devices and software is changing the values and attitudes of Generation C to judge things on the basis of "like and dislike" rather than "good and bad" while giving prominence to "feelings and emotions." Gen C youngsters seem to be politically passive.

Other Issues from the i2010 Conference

*"Security plays a key role in completing a
single European space"*
– Andrea Pirotti, ENISA, i2010

In one article it is not possible to tackle all the varied themes discussed in the i2010 conference. In what follows some additional key points presented by different discussants are shortly described.

- **Interoperability and internal markets.** Closely related to the issue of technology convergence and to fostering ubiquitous development in general is interoperability of different technologies. It was taken up by Susanna Huovinen, who said that interoperability can only be ensured by the use of open standards. We have many promising innovations that are waiting to enter the market. Innovation-friendly market can only be achieved by effective, flexible and future-proof regulation. Communications regulation, in particular, is a key condition for enabling the ubiquitous information society to emerge. And as Huovinen also stated, truly European internal markets are needed for our information and communications industry to bloom. The communications industry is waiting to move ahead to new ubiquitous levels. It is up to the regulators to enable it to do so, and to support its efforts.
- **Who is on board.** One of the topics discussed in the i2010 conference was that

of how to keep people on board, when technology is rapidly changing. CEO Veli-Matti Mattila from Elisa company turned the question the other way round. According to him the consumers are very much on board, but one can ask, whether the European public authorities and private companies have utilized the existing potentialities of the people. One of the virtual realities, which is popular among young people, Habbo Hotel, has 6,5 million users actively using the new technology (cf. the Cyworld described earlier), and thus showing how the consumers are capable of using these technologies and at the same time giving possibilities to economic players to offer their services. Electronic voting in elections using Internet is an example of a possibility, which is still mostly unused.¹⁵ Don't underestimate the customer reminded Mattila referring to the Finnish Eurovision song contest winner, monster rock band Lordi, which was not the biggest favourite even in the preliminaries in Finland to start with, but people decided differently.¹⁶

- **We are not only customers.** Director General Fabio Colasanti made an important remark that when discussing the question, whether we people are on the board of the development of the ubiquitous society, we should not only speak on terms of customers on board or not, but ask, whether citizens are on board. Speaking of customers is a narrow approach suitable for business interests, important as such, but discussions on the societal developments of the ubiquitous information society need a broader understanding of human beings as members of their societies, ie. citizens.

*"To create a Ubiquitous EU Society, we need Enhanced
Connectivity, Security and Privacy"*
– Donald M. Whiteside, Intel, i2010

- **RFID.** Sensor technology, Radio Frequency Identification Device (RFID) systems and wireless networks will be common parts of the infrastructure. Satellite navigation and other localisation services are coming. One important European innovation is the European Galileo satellite navigation system. Terminals will be multipurpose and intelligent devices which connect automatically to the network most suitable for the required purpose. Viviane Reding warned that it is possible that public opinion may turn against RFID in a similar way it did in the case of GMO.
- **Research and innovations.** Director Susan Binns from DG Information Society and Media of the Commission led the panel called 'How to keep the user on board'. In her report from the panel she presented probably one of most widely supported issues of the conference, namely that research inputs into ICT should be increased and the speed of innovating in Europe should be accelerated (which were one 'pillar' in the three priorities for Europe's information society and media policies set by the Commission, too). At the same time as user-generated contents are increasing and gaining more interest not only among the 'peer producers', but also in companies, public players and citizens' movements and NGO's, EU's research inputs focusing on societal issues and consumers, not

on technology only, should be increased. Binns also noted that the "IPR situation is a mess", which is probably true in the minds of many observers.

*"Internet is the greatest innovation platform
in the history of humankind"*

– Niklas Zennström, *Skype*, i2010

- **Technology as a great equalizer?** Jorma Ollila, chairman of Nokia and Shell International, spoke of technology as an enabler and equalizer. Susan Binns commented that technology will not automatically be a great equalizer. It is easy to agree with Binns. Technological development run by business interests has no automatic tendency to promote equality of possibilities and to narrow digital divides between people. Without democratically formulated regulations and true competition between the economic players it can do the opposite. At the same time it is good to remember Niklas Zennström's (CEO, Skype) important point: Standards should not be drawn too early, because doing that may hinder new innovations.
- **Technology and politics.** Member of the European Parliament Reino Paasilinna emphasized that at the same time as technology is expanding and becoming more advanced one should remember that political decisions are at least as important as technology per se. He also remarked that there is no union without unity. This probably should not be understood as a demand for a highly homogeneous value system in Europe in the future. One of Europe's riches is its cultural diversity.
- **Visions of European ubiquitous societies.** Interpreting Paasilinna's points freely, we should have more value-rational political and societal discussion on desirable visions of the ubiquitous information Europe. There is a lot of discussion having means-oriented character, like the debate on international economic competitive advantages. It is important as such, but before you can say, who is best in international play, you should know the name of the game you are playing. And that has to do with goals, values and visions. The European models at best have many common strengths: respect for democracy, human rights, freedom of speech, high-tech with high-touch, economic efficiency, ecological sustainability, social justice and cultural creativity. One can easily agree with Paasilinna, when he stated that information society and welfare society need not contradict but complement each other. Of course it is also a question of how clever and humane models we are discussing here.¹⁷

A Concluding Note – World in My Pocket

"We do not wait! What is a queue?"
– Philosophy of Instantism

In his concluding remarks Harri Pursiainen, Permanent Secretary of Ministry of Transport and Communications of Finland stated that:

We want Europe to be a competitive and innovative society that ensures well-being for everyone. To achieve this goal, we must first of all get information and communications technology back on the political agenda with a high priority. Productivity gains can only be achieved throughout the whole of society by using ICT, and by constantly emphasising its importance and potential... We have to create the market conditions and regulatory environment which will encourage the introduction and use of innovations, new services and new business models. Here the regulatory reform process which is about to start is essential. We need effective, flexible, technology-neutral and future-proof regulation, which pays attention to the rapid change of the technical environment. We also have to put special emphasis on our R&D policy. Steps must be taken to improve innovation culture, intellectual property rights, public procurement and the emergence of "lead markets", and address all the issues involved... Finally, and most important of all, we must not forget the users, the citizens of the ubiquitous information society. Real trust can only be achieved by promoting easy-to-use technologies and by respecting the basic rights of citizens, including privacy, consumer rights and freedom of speech. Training opportunities and easily accessible electronic public services should also be offered right across Europe, with balanced development in all regions.

Summing up and remembering the 'law of Prof. Jim Dator', ex-president of the World Futures Studies Federation – "Any useful statement about the future should appear to be ridiculous" – As we all know, engineers are much smarter people than the rest of us. That makes it pretty clear what the future of the ubiquitous information society will look like. In the not-so-distant future I can sit on the shore of a remote mountain river in Lapland with the whole world in my pocket. I don't have to wait for anything, because I live in a world of Instantism. Real time news of economy, sports, culture, etc. are at my disposal all the time. I can choose classics from the world literature ("Maybe I'll spend this day by reading through Dostojevski's whole production, or all the Potters?"). I can visit the Louvre or Metropolitan museums, or perhaps I'll watch all the episodes of the tv series Friends, or at least the earlier better ones. Something interesting is always happening in the European parliament, let's take a look. Naturally I will spend some time with my alter egos in various virtual versums (by the way, I am the owner and president of Klong, a beautiful country in the virtual world Second Life 7). I have to work, too, take part in some virtual meetings, write a memo and send it to some persons. E-voting in our local area is going on, which I have to keep in mind. What else? In the evening I want to meet my children in our virtual cottage. Etc., etc. "And today I will catch the big one!"

"What a wonderful world"

– Louis Armstrong

"... especially now, when it is in my pocket"

– anonymous

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Notes

1. http://ec.europa.eu/information_society/eeurope/i2010/introduction/index_en.htm
2. http://ec.europa.eu/information_society/eeurope/i2010/docs/communications/com_229_i2010_310505_fv_en.pdf
3. In collaboration with the European Network and Information Security Agency (ENISA), European Union (EU) Member States and Candidate Countries, European Free Trade Area (EFTA) countries, industry and relevant stakeholders. Finland has produced Presidency Conclusions in cooperation with the Commission and with the other Member States: http://eu2006.tuuletin.fi/fileadmin/tiedostot/pdf-tiedostot/i2010_Presidency_Conclusions_final.pdf
4. Matti Pohjola 2005 (I-III), Mika Mannermaa 2004 (IV-V).
5. See eg. Kurzweil 2005.
6. See www.Accelerating.org.
7. Ubiquitous comes from the Latin word *ubi'que*, ie. *everywhere*. Besides ubiquitous computing, expressions like *ambient computing*, *calm technology*, *invisible computer* and *pervasive computing* have been used. Even before Weiser the idea of *ubique* was used by a science fiction writer Philip K. Dick in his novel *Ubik* in 1969. In that book Dick described a future in which everything – from doorknobs to toilet-paper holders, were intelligent and connected, see http://en.wikipedia.org/wiki/Ubiquitous_computing.
8. Modified from Oliver 2003, see Mannermaa-Sydänmaanlakka 2006.
9. Taking a somewhat more noble perspective, one could speak of increasing importance of *knowledge* and maybe even *consciousness*. Some futurists have spoken of a *society of consciousness* or *society of idleness*. On the other hand one should not be naïve. One possible scenario for the technologically advanced societies has not so much to do with knowledge (not to mention wisdom) but instead of that we may get huge amounts of information glut, reality tv, gossip, disinformation and pure nonsense. *A society of stupidity and superficiality?* The real challenge at present is to develop *an intelligent society*, which could balance efficiency of technology and growth of economy with ecological sustainability and wellbeing of people.
10. See <http://earth.google.com/>.
11. See World Transhumanist Association: <http://www.transhumanism.org>.
12. In the longer run one may speak of a mobile personal digital assistant (MPDA) having the mobile tv feature, but several other features, too.
13. See Park Harmsen – Seo 2006 and "Digital Generation Leads New Marketing Patterns,"

- The Korea Times*, January 25, 2005, available at http://www.trendwatching.com/about/inmedia/articles/generation_c/digital_generation_leads_new_m.html.
14. See Park Hurmsen, Youngsook & Yongseok Seo. (2006). Age-Cohort Shift and Values Change: Futures for Democracy in Korea. *Democracy and Future*, p.182.
 15. In Estonia, people could vote via Internet in their municipal elections in autumn 2005. In Finland, in the parliamentary elections in March 2007, electronic voting will be experimented in three municipalities. The author of this article discusses this topic more widely in his report to the Committee for the Future of the Parliament of Finland (Mannermaa 2006).
 16. Lordi is also a good example, of how much people are on board in practicing what could be called 'swarm activism'; spontaneous Internet activism led by nobody. The members of Lordi use masks and don't want to show their faces in public. After Lordi's victory in the Eurovision song contest one sensation magazine (called *7 päivää*) published a photo of the face of the leader of the band, Mr. Lordi. It raised much anger among people; one person wrote a statement and started an Internet campaign condemning the act of the magazine. In two days there were more than 200.000 signatures under that statement, which is a huge amount in a small country like Finland. Two days after publishing the photo, the magazine apologized.
 17. Paasilinna also problematized, whether we really want to develop a European *information society* or is the vision *potato society*, while a remarkable share of EU's budget is still going to subventing agriculture.

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