

DEEP DRILLS AS TOOLKIT FOR DECISION MAKERS

(ICT prospective forecasting project in Hungary)¹

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Summary

The Hungarian National Council for Communications and Information Technology launched an ICT technology assessment and forecasting project as a proactive approach in 2005. Decision makers receive the results of this project: short studies called “*deep drills*”, longer studies with scenarios called *visions* and also a bimonthly *Panorama* with commented short news. There is a community of 40-50 professionals discussing the newly prepared studies, commenting and using them for consulting and for higher education. The approach is to find and describe the most probable future, but not the most desirable one. The point of view of the researchers is not to paint an unrealistic picture about the future, neither on the positive nor on the negative side.

At first we had to define the *scope* of the project and cut into twelve key areas: basic studies, communication, peripherals, system design, application frameworks, content management on the *technology supply* side while business, public sector and home usage cover the *demand* side, and system development, security and regulations are included as *cross-cutting* issues. Afterwards the main parts of each key area have been shortly described indicating possible *disruptions*. Then *cross effects* were seen: impacts on each other.

Deep drill has a defined template in order to concentrate on the huge amount of information processed. The first sentence is the *thesis*, it must have a main message for the reader: *what do we expect in the future, why is this important for us?* The further parts of the study show the scope, the current status, the ongoing research, the most probable future trends, analysis of the main drivers and impacts and the specialities in Hungary. These studies intend to inform decision makers and their advisors, and are not for researchers of the topic.

Thirty one *deep drills* have been prepared on the following *technology supply* topics::

- Basics: Unlimited bandwidth and computing power, Biology and informatics, Nanoelectronics, Plastronics,
- Communication: Future of Internet, Next Generation Networks, IP based television, Radiofrequency identifications,
- Peripherals End-user devices, Flexible man-machine interface, Personal identification, ICT implants, Sensor systems, Embedded systems,
- System design: IT Utilities, Privacy enhancing technologies, Service oriented applications development, Agent technologies, Long term archiving, Security focused design,
- Application frameworks: Semantic technologies, Text analysis, Business intelligence, Mobile robots, Location determination technologies,
- Content management: Web 2.0, Collective content providing, P2P and its influences, Intellectual public goods, Virtual presence and virtual worlds, Online multiplayer games.

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The preparation of the *vision* of an application area needs more sophisticated approach: beside technology supply, changes of the demand should also be examined. These changes depend on different drivers, and the forecast should be based on the drivers. The more certain drivers lead to the core vision, the uncertain ones lead to different scenarios. Selecting one social and another driver from the technical ones is a practical choice leading to four scenarios. Visions are illustrated by narratives as a feedback.

The paper describes the methodology and the impact of this technology assessment project.

All materials are available on our interactive website www.nhit-it3.hu

1 Background

The *National Council for Communication and Information Technology* (NCCIT) is a high level board advising the Hungarian government on ICT issues. In 2005 NCCIT initiated a project for a technology oriented study in order to assist the different planning and strategy making activities in the area of the information society. The project is titled "*Information Society Technology Perspectives* (IT3, according to the acronym of the Hungarian title). This study intends to survey the trends in the development and application of information and communication technologies, filtered by their expected impact on the information society in Hungary within the next decade.

During the four years of the project, we have developed some special intellectual products of the forecasting: "deep drills", visions of application areas, panorama with commented news. Decision makers receive the bimonthly panorama, the short studies called "deep drills" and also the longer studies with scenarios called visions. They seem to like these studies, because the template of these descriptions is clear, and the language is mainly everyday language avoiding the unnecessary professional jargon. We collect the information, try to understand it and provide it in a concentrated form. These studies draw perspectives of selected topics, collect the existing information sources, but do not make detailed business analysis, for investment or industrial decisions. Our studies are aimed to the interested readers who sometimes are in the position to make decisions about the topic.

2 Results

2.1 Overview

In the first part of the IT3 study 12 key areas has been defined starting with the investigation of the **demands** from the three main application areas: *business, public services, private sphere*. This **utilization pull** is confronted by the **technology push** coming from the **supply** side represented by the six key areas of core information and communication technologies (*basic studies, communication, peripherals, system design, application frameworks, content management*). This picture is complemented by three key areas dealing with **cross-cutting** issues of *system development, security and regulation*.

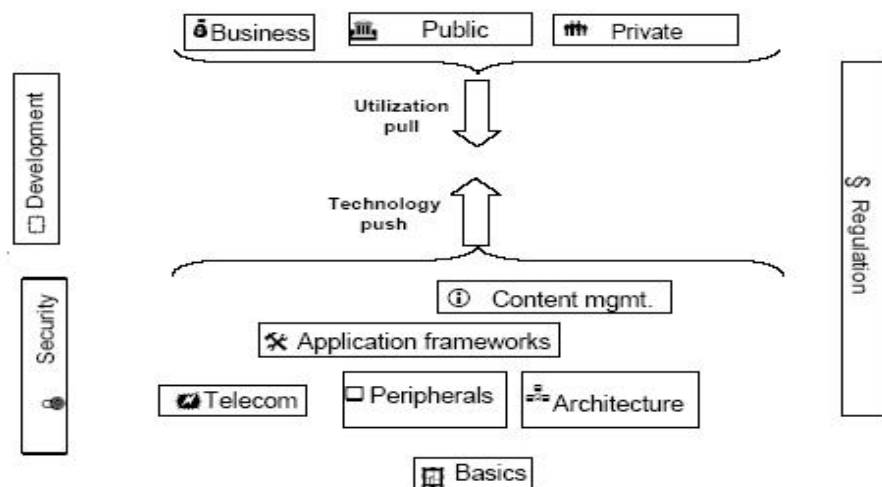


Figure 1. Key areas

In the General Overview an overall survey of the 12 key areas is given, subdividing each area into 8-10 subparts. The main development trends of the appr. 100 subparts are concisely described.

After the overview of the 12 key areas, the cross effect analysis was made among the areas. Development on one field of technology may imply new possibilities in another field of technology. For example: having new “intelligent” materials, we are able to build up new devices; having new devices new networks and systems can be made; these sensitive systems can react to the needs of human beings, or can provide new types of services. Examining the one or bidirectional influences between the key areas, we looked for potential disruptions. Disruptive potential is high when the cross effect is strong and bidirectional, where some areas provide new abilities to the examined one. This comprehensive analysis served as the basis of the deeper studies. Interconnections between the key areas are formulated in short statements presented in a 12*12 matrix.

For more detailed analysis, 31 topics have been selected from the technology supply key areas. For each of these topics, a “thesis” has been formulated describing a **technology change** likely to have considerable impact on the Hungarian information society during the 2010s.

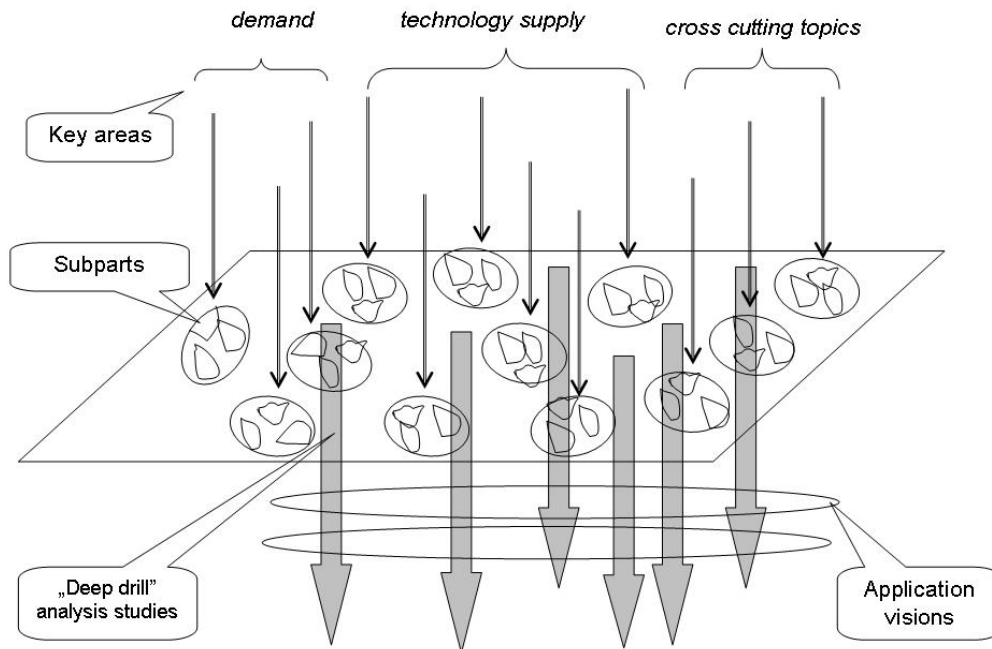


Figure 2. Structure of the IT3 study

Summary of IT3 results will be presented according to the key areas.

2.2 Demand side captured by visions

Analysis of the **demand side** starts with a hypothesis about the basic economic and societal situation of Hungary in the next decade, assuming that the market economy will be developed in our country, and Hungary goes together with the European Union without any big military-ethnic- or worldwide economic crisis. We consider some demographic problems on aging the population, and decreasing the fertility in our region. The migration is not so high as it is in Western Europe, but it exists since we are one of the border member states of the EU. We also have to consider the increase of energy costs and, because the country imports most of the energy. The climate change is not yet so relevant in our country..

The demand for the application of information and communication technologies is outlined in three key areas:

Business: While at present electronic- and paper based information are used parallelly, in the future only the computer based ones become predominant, based on business to business information services. As a result, rural areas can be used more for businesses. In content providing industry the profit models are being changed.

An application vision on *“Information-related working methods in enterprises”* has been completed. The main message is, that business intelligence should be used in order to maintain competitive potential of the firms, even not only by large businesses, but also by smaller independent firms forming a cluster. Most uncertain drivers are: the structure of the firms

(whether they are large multinationals or networks of smaller ones). The other uncertain driver is the usage of knowledge management systems or not.

Public services Business community needs lead to real time services from the government side to the market players. The public administration and public services (together with the processes to provide them), should be modernised in order to be efficient and effective enough, and to achieve the expected EU level.

An application vision on “*Electronic government*” is being prepared. The main message is to be, that the electronic services of the government should be developed more or less together with the usage of ICT in the business community to accelerate further development. The most uncertain driver is, that the part of GDP redistributed by the public administration will grow or not, and the public services will be provided by outsourcing partners or not.

Private sphere Society will be reorganised along the new types of networks. These networks, having ICT support, may grow faster than before. The main activities of professionals are supposed to change form: into projects, working, buying, learning or making administration at home. This may change the whole consuming structure too.

An application vision on “*Intelligent home*” has been completed. The main message is, that the intelligent products and services spread into the homes, not only the intelligent buildings but living at home itself will be re-extended with home working, home learning and assisted living functions. The more uncertain driver may be the cost of energy and the level of the services provided for home living (like meal delivery, nursing at home, etc.)

2.3 Technology supply captured by deep drills

Technology supply is analyzed in six key areas covering in a very broad sense most of the core technologies used in modern computing.

2.3.1. In the “Basic studies” key area we are talking about some of the scientific disciplines serving as foundation to information and communication technologies, such as material sciences, (micro)electronics, (quantum)physics, biology, (mathematical) computing science. The following “deep drill” studies relate to this key area:

- a. *Unlimited bandwidth and computing power*, shows the perspectives and consequences of the continuous increase of hardware capabilities in the areas of data communication, storage capacity and operational speed.
- b. *Biology and informatics* describes the two sides of the connection between biology and IT: application of computing methods in all branches of biology on one side and the use of biology-based methods and tools in the development of new computing paradigms (“biologically inspired computing”) on the other.
- c. *Nanoelectronics*, outlines both the results coming from the size reduction of microelectronic components as well as the developments of completely new kinds of devices, like e.g. nanotubes.
- d. *Plastronics*, investigating the use of organic materials in micro- and optoelectronic circuits.

2.3.2. In the key area of “Communication” the next step is to make seamless connection among different business players and customers, in order to provide new content-based products. The following “deep drill” studies relate to this key area:

- a. *The future of the Internet*, outlines the role of Internet as a critical infrastructure of the society and economy, investigating the challenges of maintaining its efficient and reliable operation in the future.
- b. *Next generation networks (NGN)*, provides seamless interconnection between inhomogeneous networks, to allow interactive content provision at assured quality of service.
- c. *IP based television (IPTV)*, can be based either NGN or Internet access, the interactive content provision may disturb the existing business models based on cross financing, moving from advertisements toward classical contents.
- d. *Radiofrequency identification (RFID)*, deals with devices placed in various objects for performing physical and information processes mainly for the purposes of identification.

2.3.3. In the key area of "Peripherals", devices realizing the connection between IT systems and the outside world are described, including both tools for communication between computers and human beings as well as situations where computers are directly communicating with outside objects ("ambient intelligence"). The following "deep drill" studies relate to this key area:

- a. *The multitude of end-user equipments*, describes the diminishing role of traditional (personal) computers in accessing information services, giving way to infocommunication capabilities built into different kinds of devices used for various purposes.
- b. *Flexible human-computer connections* with multimodal interfaces to help people to interact continuously with the computer.
- c. *Personal identification techniques*, biometric technologies are under research, and will be applied in combined systems, describing also the social consequences of the use of such methods
- d. In the study about *ICT implants*, new perspectives of man-machine communication are presented in the form of equipment built into (or near to) the human body, to be used both for medical and entertainment purposes as well as for the extension of human capabilities. Legal, ethical and regulatory aspects are also elaborated.
- e. *Sensor systems* present the ever increasing role of sensors and actuators in the connection of IT systems with the outside world, along with the perspective of growing intellectual and communication capabilities of sensors organized into networks.
- f. *Embedded systems* deals in a more general note with the problems of designing and implementing systems with embedded infocommunication elements, outlining the significant technological changes also in industrial branches other than IT, in the areas of standardization, system integration, software development.

2.3.4. The key area System design deals with organizational questions of all kinds of systems, made out of different kinds of components (which can be systems themselves) starting from (cores of) processors going to the networks,. Basic principles (like parallelism and virtualisation) influencing the organization of systems at all level are also outlined. The following "deep drill" studies relate to this key area:

- a. *IT utility services*, describes the appearance of centralized IT capabilities performing the information processing tasks of many users in a service-like manner, according to well-defined quality of service criteria (cf. "cloud computing").
- b. *Privacy enhancing technologies (PET)*, introduce different kinds of technological solutions assisting the protection of the private sphere of the users, being built systematically into the information systems as a standardized layer.

- c. *Service-oriented application development (SOA)* outlines the tendency of building application systems from ready made elements – running sometimes on different computers and connected by networks – performing services of well defined functions and quality
- d. *Agent-based technologies*, explains how system components (agents) capable of autonomous operation and their multi-agent systems can be used both in more efficient man-machine communications and in solving sophisticated application problems.
- e. *Long range data archiving*, deals with the specific, but very important problem of storing information in a recoverable form over a long period of time on frequently changing equipments. Both technological and organizational solutions are worked out and the status of their standardization outlined.
- f. *Security-conscious development and operation*, outlines technological methods and tools for the development and operation of reliable systems and the regulatory actions maintaining their use.

2.3.5. In the key area *Application frameworks* enabling technologies, used in the development of certain classes of application programs are described. They are using the services of lower software layers like the operating systems and/or middleware, the most frequently used tools, however, may be built into that layers. The following “deep drill” studies relate to this key area:

- a. *Semantic technologies*, describes solutions where meaning of various data is used – similarly to the human thinking – together with the role of “metadata” (i.e. information about the data itself) for more efficient storing, searching and processing of the information.
- b. *Text analysis*, explores different natural language understanding and/or analysis methods and their extensive use as organic part of modern information processing systems and also as tools for efficient man-machine communications.
- c. *Business intelligence*, gives an overview of sophisticated data analysis tools increasingly being used in the future not only by large enterprises but also by other organizations and even by individual users.
- d. *Autonomous mobile robots*, describes technologies to produce mobile robots performing complex tasks for everyday life applications in households, healthcare etc.
- e. *Location determination technologies*, analyzes the tools and methods for finding the geographical location of objects in order to develop location based services becoming increasingly popular in mobile applications.

2.3.6. In the key area *Content management* procedures are surveyed for creating, developing, classifying, searching and storing information to be used as content in different information technology applications. The following “deep drill” studies relate to this key area:

- a. The study titled *The Web 2.0 phenomenon (and all what is behind it)*, describes the possibilities of creating more efficient cooperation methods of the users as result of Internet developments, using the Web as a full operation platform.
- b. *Collective content production*, analyzes the more “traditional” forms of non professional content production by individuals and communities, like blogs and wikis, as well as new services like microblogging.
- c. *P2P solutions and the content industry*, explores the increasing use of solutions mutually utilizing information stored on different computers (as well as their computing power) and the business models and legal regulation caused by these methods, especially in the music and movie industries.

- d. *Virtual reality and virtual worlds* deals with the tools for the development of 3D content and their use in creating (synthetic) virtual worlds and their fast developing applications in many fields of the society and economy.
- e. *Online multiplayer games* are important applications of virtual worlds with increasing emphasis on artificial intelligence solutions and the connections between the real and virtual worlds.
- f. The study *Intellectual public goods (“Open source”)*, deals with some legal issues of content production and distribution, such as intellectual property rights, different kinds of licenses (like Creative Commons), including the problems of distributing software in “open source” form.

2.4. *Cross cutting issues*

In the section on **Cross-cutting issues** three key areas are described, having importance both on the demand and supply sides of the picture.

- In the key area *Development and maintenance*, issues about creating and operating infocommunication systems are outlined emphasising the increasing role of services in all activities.
- In the key area *Security*, all aspects effecting the trust in ICT systems are dealt with, including reliability of operations, protection of data against failures or misbehaviour, preserving personality rights etc.
- In the key area *Regulation*, different regulatory tools like legal- and self-regulation as well as support policies and standardisation are considered, as the society intends to regulate the situations of asymmetric information and market power, mainly in the network industry and content providing through new media channels.

2.5. *High level vision*

The **high level vision** about the Hungarian information society of the next decade comes from summarizing the results of the “drill down” analysis studies. The following main trends can be identified:

I. Practically unlimited **performance** parameters

The extremely fast increase of all performance parameters of the infocommunication systems (processing power, storage, bandwidth etc.) continues, and is supported also by new paradigms of computing and system organization.

II. Total **connectivity**

Global connectivity becomes universal, with the result, that practically all computers can always be connected to any computer in the world, having access to an unlimited wealth of information.

III. Processing and communication capabilities of “**ambient**” objects

Information processing and communication capabilities appear – beyond the (personal) computers – also in the objects of our environment, being able to communicate with each other and with the outside world independently of human users („ambient intelligence”).

IV. Increasing **intelligence** of systems

Different forms of intelligent behaviour appear more and more often in our IT systems and services, increasing the efficiency of information processing and also enhancing the convenience of human-computer interaction.

V. **Service** orientation on all levels

The operation of infocommunication systems is increasingly based on services provided by different organizations (or devices) to each other (e.g. web services, hosting, utility-type services, “cloud computing” etc.).

VI. **Collaboration** between users

Infocommunication systems increasingly support different forms of communication between their users making use of various ways of collective activities (like creation of content etc.) and organizing virtual communities.

VII. Importance of all aspects of **Trust** and **Security**

Increasing dependence of the users (and of the society) on infocommunication services creates increasing challenges towards all aspects of trustworthiness of our systems, including faultless operation, preserving data integrity and secrecy and also protecting privacy.

2.6. *News in Panorama*

In the process of preparing the IT3 studies “watching the reality” is a very important activity of the project members. As the result of this a useful by-product, a bimonthly newsletter “**IT3 Korkep**” (IT3 Panorama) is being published containing actual news items relevant to the topics of the project. This is some kind of feedback from the reality. These short news items may show the milestones in the roadmap of the future described in our deep drills, or might inform us about another scenario or driver, we did not think before. All news are labelled to the corresponding key areas. Our added value is to select and comment them: why we think it relevant to the future?

Each issue contains:

- an editorial about a technological topic, written by the project members,
- 24-26 short news items with pictures and comments,
- a “Social perspectives” article about a society-related feature written by social scientists.

Examples of editorials

- Rules of convergence and paradigm shift in communication (Aug-Sept 2005)
- Virtualization in IT (Nov-Dec 2006)
- The future of document formats (May-June 2007)
- A different view on the future: The Singularity (May-June 2008)

Examples of „Social Perspectives” features

- New forms of social movements – „dark mobs” (July-Aug 2007)
- Information, information and more information (“information overload”) (May-June 2008)

From September 2006 all issues of IT3 Panorama are available also in English.

3. Methodologies

The basic working method of the IT3 studies is *desktop research* by searching, reading and classifying the information about new developments in the field of infocommunication technologies. The main tools for presenting the results are

- in vertical direction the *deep drill* studies on the technology supply side
- in horizontal direction, the *application visions* on the utilisation demand side

3.1. The structure of the deep drills

Deep drill has a defined template in order to concentrate the huge amount of information processed (see Figure 3).

- The first sentence is the *thesis*, that must have a main *message for the reader*: what do we expect in the future and why is this important for us? Other parts of the first chapter show *the scope* of the study more precisely.
- The second chapter is the description of the current status. It tends to be neutral; *we do not evaluate, only describe* the current situation.
- Then we collect examples of ongoing research on the field (giving their websites and other sources). To do this – third – chapter, the *first core activity* of our desktop research is *mining the web*. Putting deeper and deeper questions, the author must understand the structure of the ongoing innovation processes of the defined scope, then he/she should compress this huge amount of information.

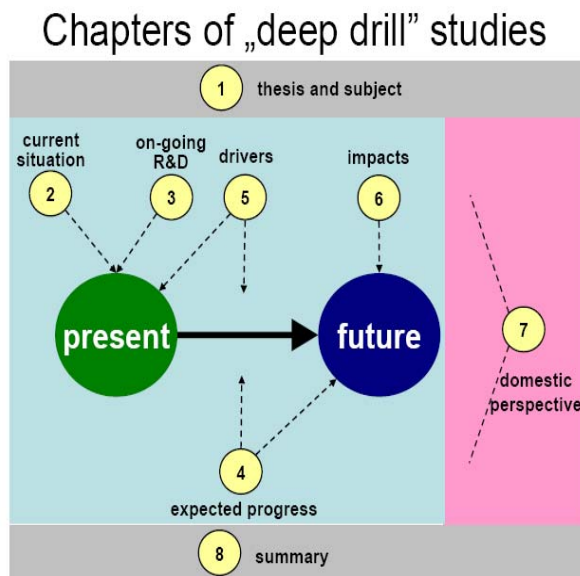


Figure 3. Template of the “deep drills”

- The next (fourth) chapter is the description of the most probable future including a standard graphic visualisation of the roadmap (see Figure 4). To do this chapter is the *main value adding activity* of our work: the author tries to understand the influences among the parallel ongoing processes, estimates the timing of the expected changes, and *imagines the roadmap* to the future .
- The next step (fifth chapter) is the *driver analysis*: technological, societal and economical drivers may enhance or hinder the imagined developing process on the examined technology field. For example: an interactive technology may enhance the providing of private content, but the lack of foreign language skills might hinder it.
- Next (in the sixth chapter), is to estimate the *potential impacts* of the supposed development. New technological products or services are only part of the supply side. Users

- The seventh chapter shows the *domestic situation in Hungary*, which is already EU member, but not wealthy enough. There are fields where Hungarian researchers are able to go with the mainstream of the changes, but there are areas with gaps, too. We try to show the ongoing domestic research, and assume the field's. knowledge potential
- In the last chapter we make a short conclusion for the reader. We assume, the reader is a decision maker or expert, preparing decisions (distribution of financial or physical resources, policy making, etc.). They need concise information about the technology, but they do not need any kind of pressure or direct lobbying for one or other decisions. Therefore we have an unwritten rule: we do not give direct advices in our studies. *The message is only that: be informed, consider yourself and understand the situation, before you make your own decisions.*

The “deep drills” try to use common style of visualisation within the material. All of them contain the following figure adapted to the situation

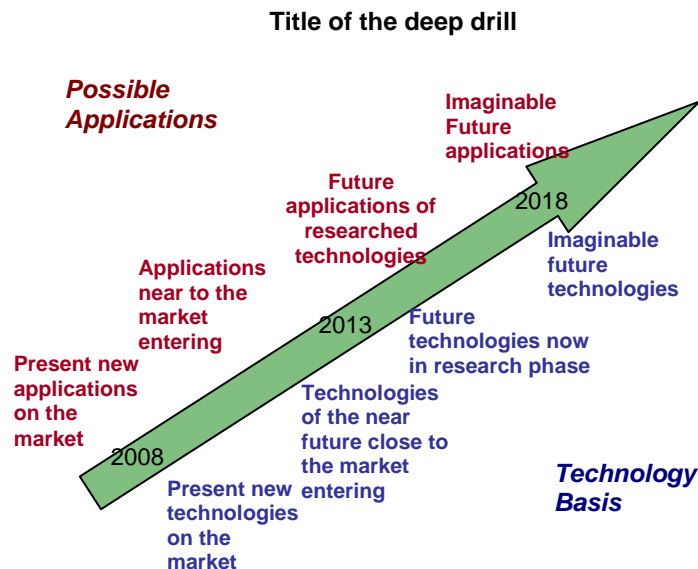


Figure 4. Common visualisation within deep drills

The 31 “deep drills”, were prepared by 12 authors. Most of the studies were written by the five project members, but there were another seven colleagues to write about special areas, like nanotechnology, privacy enhancing technologies, location based technologies and P2P communities.

During the preparatory phase, the project team discusses the semi-ready text. The main issue is to find the drivers and the major impacts of the area. This part of the study needs the most interdisciplinary approach. Therefore, the mixture of the people seems good: we have computer scientists, lawyer, engineer-economist and master of liberal arts too. Having made the study of technology supply, it is presented to a small community of 40 professionals called IT3 Friends

association. This open community listen to the presentation, put up questions of understanding, comment the future impacts and in many cases add something to the domestic situation part.

3.2. Preparing visions with scenarios

The *vision making* of an application area needs more sophisticated approach: beside technology supply, changes of the demand should also be examined. The future is more uncertain, analysis should be based more on the drivers.

The visions also have fixed template, similar to the technology focused deep drills.

- The first sentence is the *thesis*, which says the main message. Then first chapter give the scope of the vision, it is always a application area, so it deals with the demand side of the market.
- The second chapter describes the *current status*, without evaluating it. The main issue is to show the major functions of the application area, and describe ICT technologies used by these functions. For example, the vision called “intelligent home” shows, that the families sleep, eat, amuse, work, learn at home. During these activities the members of the family may use computers, game services, distance learning and home security services. The function of the home is not the same for a single person and for a family, there are differences between rural-, urban and metropolis areas, too.
- The third chapter is an overview of the *ongoing projects* related to the field. The authors should select the huge amount of information on two major points: is the function scale of the application area changing or not, and whether is any unresolved demand on the field? For example, the assisted living projects try to react to the ageing process. Another example: new buildings driven by computer try to react to the high energy costs and environmental expectations.
- *Drivers* are listed systematically, and grouped into political, economic, social and technological categories (the well known PEST concept). Figure 5 shows an example from the vision called “*Information-related working methods in enterprises*” The listed drivers should be defined and two estimations should be made then: how strong is the correlation between the driver and the visions field, is it an enhancing or hindering factor, and is the future of the driver certain or uncertain?
- The *main vision* is based on the more stable drivers with strong influences to the field. Authors first estimate the future of the drivers, then describe the future of the examined field. This is the major value added by them to the research.

<p style="text-align: center;">Political</p> <ol style="list-style-type: none"> 1. Level of EU integration 2. SMB-friendly legal environment 3. Support for R & D 4. Integration of EU public administration 5. Efficient public services 6. Value of public information 7. Infrastructure of education 8. Openness of education system 	<p style="text-align: center;">Economical</p> <ol style="list-style-type: none"> 1. IT investment 2. Utilisation of EU resources 3. Value of intellectual assets 4. Changing enterprise organisation 5. Maturity of service sector 6. Extent of outsourcing 7. Directions in labour market 8. Entrepreneurship
<p style="text-align: center;">Social</p> <ol style="list-style-type: none"> 1. Knowledge of advanced technologies 2. Aging society 3. Role and impact of the IT generation 4. Mobility in work 5. Safety of life and property 6. Environmental challenges 7. Adult training and education 8. Multi-cultural society 	<p style="text-align: center;">Technological</p> <ol style="list-style-type: none"> 1. Reliability and security 2. Flexible IT architecture 3. Integration solutions and web 2.0 4. Knowledge magement systems 5. Business intelligence 6. Intelligent wearable appliances 7. Common intellectual assets 8. Bandwidth 9. Virtual presence 10. Ambient intelligence 11. Sensor systems 12. Document management and archiving systems 13. Digital maps 14. Mobile internet 15. Semantic systems

Figure 5. Drivers of the “Visions” listed in PEST concept

- After the main and the alternative scenarios there are illustration by narratives. This part of the essay serves as feedback to the scenario engineering.
- *Alternative scenarios* are based on more uncertain, but strongly influential drivers. Selecting one social and one technological driver is a practical choice leading to four scenarios (see Figure 6)..

There is another unwritten rule: we do not paint only positive and over-happy situations, because it would be unrealistic; the supposed future should have positive and also negative elements.

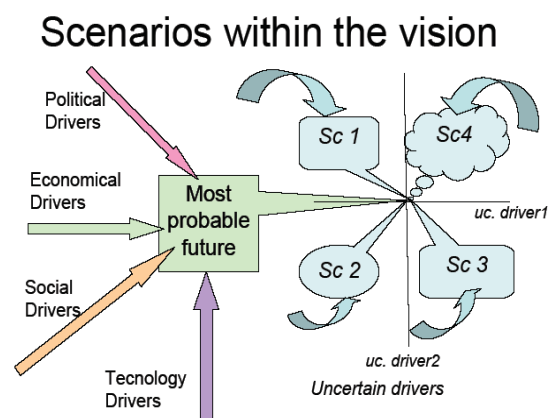


Figure 6. The main and the alternative scenarios

- The conclusion is the last part of the vision. As before, we do not make any kind of direct advice. The message is: *look and imagine*, the application area may change due to different drivers.

4. Dissemination

Results of the IT3 project are being utilized in many ways:

NCCIT maintains a distribution list of approximately 150 persons who receive all materials in printed form. The list includes:

- as the main audience, decision makers of different levels in various government offices (positive feedback is sometimes accompanied by suggestions for further topics to be investigated)
- CEOs of key enterprises of the Hungarian ICT industry (domestic and multinational)
- deans of IT faculties of universities and high schools
- high level researchers in academic institutions
- leading officers of professional civil organizations

In electronic form all materials are freely available on our interactive website www.nhit-it3.hu, with easy to use searching possibilities (mostly in Hungarian, with some English texts).

Some of the studies are being published in various Hungarian professional journals

At some universities IT3 studies are being used as teaching material

There is an informal community of about 40 professionals ("Friends of IT3"), with monthly personal meetings where new studies are presented and discussed

Two national conferences were organized:

- in April 2006 together with two professional societies: John von Neumann Computer Society and Scientific Association for Infocommunications
- in October 2007 with the participation of the California-based Institute for the Future (NCCIT is member of IFTF's Technology Horizons program)

Findings and methodologies of the IT3 project are being used in the strategic planning activities of the National Technology Platform on "Mobile and Multimedia", headed by Hungarian Telecom and supported by the National Office of Research and Technology.

A book, containing the updated in 2008 versions of the studies is due to be published in December 2008.

All materials are available on www.nhit-it3.hu, it has some parts in English too.