Vision-Building for the Knowledge Society – The Experience with a Romanian Foresight Exercise

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Abstract. *In line with the growing interest worldwide in futures research on knowledge society topics, the Romanian Academy conducted, in 2001, a foresight project aimed at building a vision of the "Information Society - Knowledge Society". While carried out within a short delay through utilizing simple IT tools, the Delphi survey undertaken in this framework can be considered as a national foresight exercise, its impact being recognised as significant within the relevant community of stakeholders.*

Key words: knowledge society, foresight, Delphi, IT tools, groupware.

Introduction

In 2001, the Romanian Academy ran a "priority project" addressing Information Society – Knowledge Society (IS - KS) issues, with a view to developing concepts, visions and solutions enabling the upcoming of this new society in Romania (see: http://www.racai.ro/SI-SC/index.html, and http://www.academiaromana.ro/pro_pri/pag_com01socinf_prpri.htm).

At that time, advanced economies and mature organizations worldwide were already knowledge-driven. In the European Union framework, ISTAG (IST Advisory Group) produced, in 2000, the scenarios "Ambient Intelligence" for the Europe of the year 2010 (http://www.cordis.lu/ist/fp5-istag.htm), while member and accession countries were, in turn, committed to implementing the *e-Europe* program and its *e-Europe*+ complement, respectively. In particular, Romania exhibited an "informational under-development" (Drăgănescu, 1999), hence the imperative of taking immediate action so that a leapfrog-type evolution be triggered, otherwise the country would have had to face the worst alternative of getting out of track.

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Given both its importance and complexity, the IS - KS issue was recognized as a priority on the Romanian Academy agenda, the country's highest scientific and cultural institution; the steps it chose to take in order to stimulate foresight approaches in this field were determined by its top-level position in the national research system and also by its unique capacity to create a pool of expertise nationwide.

The priority project "Information Society – Knowledge Society" was directed by a vice-president of the Romanian Academy and involved more than 40 participants, whose contributions were generated and processed mainly electronically. This project included, among other activities, conducting a Delphi survey aimed at structuring the IS - KS problem in conceptual terms, as well as defining landmarks and options relevant to major stakeholders (policy and administrative decision-makers, academic and professional communities, business sector, mass-media, etc.).

The purpose of this paper is to briefly describe the practical experience of utilizing simple IT tools in the above-mentioned foresight project that aimed at building a vision of the "Information Society - Knowledge Society", with a particular emphasis on the Delphi study conducted in this framework. The suitability of groupware and group decision support systems in future-oriented works is also discussed.

The paper is organized as follows: first, the role and characteristics of foresight research is emphasized; then IS - KS priority project of the Romanian Academy, with the Delphi survey as its core, is reviewed; next, a presentation of the main features and types of computer supported - cooperative work tools is made. The conclusions drawn refer to the relevance of the experience with the Romanian Academy's foresight project on the IS - KS theme, and also to the possible usage of more advanced IT - based tools for futures research purposes.

Foresight Exercises: General Characteristics

Foresight exercises are interdisciplinary studies that aim at envisioning possible, probable or desirable futures. They are meant to address complex societal issues, such as, most frequently, but not limited to, science and technology development and policy. The use of foresight research for designing science and technology policies results from the need to face the challenges of high tech developments, to respond to increasing global competition and to develop inter-organizational strategies (van der Meulen and Lohnberg, 2001); in this respect, significant results and experiences were reported from Japan, the U.S., the Netherlands, Germany, Australia, New Zealand, the U.K. (Martin, 1995).

More recently, newly emerged issues, such as globalization (Martin, 2000), and advancing knowledge society (European Foundation for the Improvement of Living and Working Conditions, 2003) were added to the futures research agenda.

Relevant current practices in the field include foresight exercises undertaken by governments, public and private institutions at either regional, national, and

international level (Belis-Bourguignan *et al*, 2001, Gertier and Wolfe, 2004). In the framework of national foresight exercises, the following methods are commonly used: projection, relevance tree, morphology, critical technologies, Delphi, and scenario (Shoemaker, 1995). For the success of foresight studies, the following aspects are considered to be of major importance: bringing together the different stakeholders, building consensus between them on future directions, and committing them to the respective studies' results (Reijs, 1994).

*"Foresight is a powerful tool for imagining possible futures, for raising public awareness, for helping decision-making and addressing questions related to the relationship between science and society." (*de Lattre-Gasquet *et al., 2003)*; this is owed to their role of absorbing or reducing uncertainty, thus contributing to building a bridge between science and society.

Besides the importance of their results, foresight exercises are even more valuable as a process of communication, network building and collective learning of the actors involved. (Belis-Borgouignan and Lung, 2001)

IS-KS: A Major Project of the Romanian Academy

According to its Charter, the Romanian Academy (RA) is an independent scientific body having a triple role. First, RA is a learned society, a scientific consecration forum in science and arts. It also is a network of research centers that perform basic research. The third role of the Academy is to carry out advisory studies for the Government and society on all the important issues in sciences and arts. The first study on integration of Romania into the EU, known under the name "ESEN 1", was carried out in 2000 and it was consequently refined by the Government and forwarded to the European Commission as a national Accession Strategy. ESEN 1 is one of the so called "priority projects" of the Academy.

The Story of the Project

In 2000 the *Romanian Forum for the Information Society*, founded in 1997, and led by Prof. Mihai Drăgănscu, the head of the IT section of the Academy, launched the "Charter for the Information Society" in Romania. That manifesto-type document (Filip, Drăgănescu, and Trandafir, 2000) set up several principles and put forward several objectives with a view to raising the public awareness and to stimulating the process of implementing Information Society technologies, as well as working and living styles in this country.

In January 2001, the President of Romania asked the Romanian Academy to work out a strategic plan on building the information society in the country. The president of the IT section proposed to consider The president of the IT section of the Academy proposed to consider the Knowledge-Based Society instead of

Information Society, which he viewed as an earlier stage in the "Information Era". The vice-president of the Academy, who was appointed as project manager and had been involved in the EU works of creating the Ambient Intelligence scenarios in 2000, proposed to elaborate a vision building work instead of the strategy, that, he considered, was to be made by the Government.

In April 2001, the project entitled "Information Society - Knowledge Society" was launched as a major interdisciplinary work of the Academy. The work was intended to address the main IS - KS technology vectors and their impact on the Romanian society sectors (economy, social and political life, education, research, culture) over the next ten years. The *target audience* consisted of public administration bodies, managers of IT companies and other future potential users of IT, trade unions, and youth organizations. The *aims* of the work included (a) raising public awareness and helping consensus building on IS-KS issues, and (b) providing Government and companies with a scientifically sound body of knowledge to be used in decision making and strategic planning. The project was completed in December 2001.

Project Characteristics

The project aims and scope conflicted with the low financial resources granted, the relatively limited experience in using systematic methods and the short time allowed for the completion of the work. The project manager took this contradiction into consideration when he proposed the project schedule and made decisions about the people invited to contribute to the work.

The *project team* consisted of over 40 experts with various backgrounds (IT specialists, economists, lawyers, sociologists, psychologists, geographers etc) from various organizations (institutes of the RA, universities, other R&D organisations, private industry). The experts were selected based on their high reputation and competence in the fields the project had to address together with their willingness to contribute to a work of national significance. It is worth noticing that among the experts invited to take part in the work there were many people the project manager had never been able to meet in person. Because the people who accepted to participate in the work belong to different organizations that are located in different places and the project schedule was very tight it was decided to use IT tools when performing the vast majority of the tasks.

The *project schedule* included:

a) A preparatory task, to identify issues through directed environmental scanning. The members of the project core group that intensively utilized browsers to explore various electronic documents performed the task.
b) A Delphi survey that was meant to (1) reach consensus in defining the main concepts to be utilized, (2) evaluate the existing state of IS – KS in the country and extrapolate the tendencies, and (3) formulate major

strategic options. The results were sent in July 2001 to mass media, public administration, political, parties, youth organizations, trade unions, and professional associations.

c) A series of individual studies addressed methodological issues, the development of IT&C (information technology and communication) technological infrastructure for IS – KS, and the impact of the new technologies on various facets and sectors of the society such as: (1) economy and business development, (2) social and legal aspects, (3) education and training with and for IS – KS, (4) government institutions and their contacts with the citizen, (5) science, research and innovation, (6) the development of a culture economy, (7) health care. The most utilized methods were scenarios (Shoemaker, 1995) and cross impact analysis. All the studies were published on Internet) and in a printed volume (Filip, 2001), that was distributed to interested stakeholders.

One may view the work on IS – KS as a combination of foresight and technology assessment.

The Delphi Survey: a Case Study

Reference can be made to applications of the Delphi technique to aspects related to the IS – KS issue, such as designing technology policy or knowledge management strategies, not only in developed countries, such as Germany (Scholl, 2004) or Austria (Tichy, 2001), but also in former transition countries, such as Hungary (Havas, 2003). Besides the traditionally recognized utility of the Delphi technique in policy elaboration, decision problem solving or foresight approaches, its more recently revealed strength as support for democracy is attested in literature and current applications, for instance, by the DEMOS Project (EU IST Programme, 1999).

As to the Romanian experience with the Delphi technique, not too many significant results could be reported before launching the Romanian Academy IS – KS priority project. As a consequence, the survey conducted under the respective project came to make a difference not only by virtue of the novelty of its expected results, but also by its significance as a successful experiment of expert opinion elicitation at a national level.

The Delphi survey conducted under the Romanian Academy project was designed according to the principle that promoting the Information Society - Knowledge Society requires the use of knowledge and IT-based solutions (see http://www.academiaromana.ro/pro_pri/delphi_sisc.htm). Therefore: (1) the Internet-based type of survey was adopted; (2) panelists were experts and participated on a voluntary (no fee) basis; (3) the panel was meant to became the core of a sustainable community of practice focusing on the issue of IS – KS in Romania.

Facts

As to choosing the appropriate type of survey (i.e. "policy Delphi", "decision Delphi"), a mixed approach was adopted, in order to reach consensus in terms of concept definition and strategic option formulation, while fostering creative diversity in terms of generating operational solutions.

The panelists belong to the category of expert level professionals specializing in fields directly related to the main aspects of the IS – KS subject (IT, economics, social sciences, cognitive sciences, law etc.) and affiliated with either universities or academic research institutes. They were selected on the basis of their recognized dedication to promoting IS – KS and also of their availability to contribute anonymously in the survey-based foresight study over a two-month period; the rate of response to the questionnaire was of about 35%, and the list of respondents was only made public at the stage of releasing the final report on the Delphi survey results.

The questionnaire was made up of 12 items, grouped into several sections, as follows:

a) Defining the IS – KS concept and designing the major strategic options on how to promote it in Romania (e.g. whether the evolution towards IS – KS should take place according to a national specific model or through getting aligned to internationally established trends, the right balance between planned versus emergent developments etc.);
b) Assessing Romania's state to date with respect to the presence of the IS – KS characteristics: strengths, weaknesses, gaps (e.g. how some of the existing technological and infrastructure gaps could possibly be converted into further development opportunities);
c) Identifying and prioritising the actions required in order to trigger the leapfrog-type development of the IS – KS in Romania (e.g. what Romanian involvement within the e-Europe/e-Europe+ framework should consist in, what specific roles should each of the main stakeholders play etc.);
d) Estimating the hidden costs of either delaying action or not getting engaged in it (e.g. opportunity costs incurred by keeping up with existing inertial trends, estimation of brain-drain and knowledge gaps economic and social effects etc.).

Each question was complemented by detailed explanations aimed at ensuring its proper understanding in line with the survey purpose, along with recommendations pertaining to the nature and format of the expected answer.

Expert opinions were processed by the Delphi survey co-ordinators in a qualitative manner and in a two-round procedure. The first round involved opinion mediation, including re-examining the answers that turned out to be highly controversial; it ended with a mediation report that was made available electronically to panelists. The second round consisted in systematizing and sense-making of the full body of knowledge thus generated, that resulted in a final report, released on

the Romanian Academy website as an official document of the IS – KS priority project (Filip and Dragomirescu, 2001).

Evaluation

Given the two-month deadline, as required by the Romanian Academy priority project time schedule, the use of Internet support for unfolding the survey turned out to be the only feasible option. While the costs incurred were rather negligible, the conceptual effort required from the panelists and survey co-ordinators was considerable.

The impact of the Delphi survey consisted not only in raising Romanian authorities' and public's awareness with respect to the IS – KS issue, but also in generating a creative knowledge flow relevant to this field; the recognized credibility of panelists, the pertinence of the survey questionnaire and the transparency of the two-round processing procedure were the main grounds of validity of the ideas exposed in the final report. This document contributed to adding the IS –KS issue as a priority on the policy-makers agenda at the national, and organization level.

On the other hand, the results confirmed the success of the first notable Delphi experiment in the 21st century Romania. For instance, the panellists' initial commitment evolved towards extending their involvement with the Romanian Academy project in its further unfolding; most of them authored thematic studies focusing on the main aspects of the IS –KS issue, including cross-impact analysis and evolution scenarios generation.

Applying the Internet-based Delphi survey to investigating the future of the IS – KS issue versus the Romanian context proved to be the viable choice, as compared to the alternative of commissioning a foresight study to a consulting agency.

The rate of response that was slightly under the internationally accepted limit can be explained by the novelty of both the subject and the investigation technique used to approach it. The Romanian tradition privileged synchronous group interaction (seminars, nominal groups), and specialised thematic approaches, rather than asynchronous, network-based group dynamics and generalists' examination of the issues at hand.

As to the perspectives of the IS – KS development in Romania, the Delphi survey significantly contributed to confirming prior hypotheses (Drăgănescu, 2001), such as: (1) there is a continuum between the Information Society and the Knowledge Society; (2) the advance towards the Knowledge Society should be dealt with as a priority for the country's near future instead of a remote one; (3) coping with the gaps Romania encounters at present with implementing the Information Society involves intelligent application of IT solutions; if organizational and social systems are adequately prepared to become mature beneficiary of resulting changes, the leapfrog evolution straight to the Knowledge Society stage was rendered possible.

Advanced Tools

Most *Future-Oriented Technology Analysis* (FTA) (Porter and colleagues, 2003) projects imply group work. This is characterized by communication and collaboration of several people that are sometimes placed in different locations and might prefer to work in an asynchronous manner. If traditional face - to - face meetings are used to perform the group work, several inconveniences could be noticed such as: (1) imperfect composition of the group, (2) inadequate planning and poor control of the meeting, (3) "group think", (4) high costs to organize the meeting.

Computer Supported Cooperative Work

Fortunately, at the present time, there are several *Information Technology* (IT) products, called *groupware* meant to facilitate group work and enhance the productivity of the people involved through various services provided such as: messaging, teleconferencing, collaborative authoring, group decision support, coordination.

The main general - purpose groupware products that might be utilized in FTA group works are: a) *Lotus Notes /Domino Server*, that provide e-mail, distributed databases, text editing, bulletin whiteboards, electronic document management, consensus building, e-vote and so on (www.lotus.com), and b) *Microsoft NetMeeting*, that includes whiteboarding, remote desktop sharing, file transferring, data conferencing and so on (www.microsoft.com). Other well known products are: *Oracle Office* of ORACLE, *GroupWise* of Novel Corp, *Team Office* of ILC Inc, *Collabra* of Netscape Corporation. Lists of groupware products are given by Fraunhofer Institute for Software Engineering (www.do.isst.fhg.de/workflow/index_e.html), D.R. Wooley in his portal "Collaborative Work Environments" (http://thinkofit.com/webconf/workspaces.htm) or by Diamond Bullit Design (http://www.usabilityfirst.com/groupware/index.html)

As remarked in (Martin, 2000) "foresight represents a useful tool to aid decision-making in relation to R&T policy". This is also true for other FTA methods. A particular category of groupware products that have been utilized during the last two decades in strategic planning in industry and is suitable for foresight works [and several other FTA methods] is called *Group [Decision] Support Systems* (G [D] SS) (Power, 2002). The GDSS standard functions support the following activities:

a) Idea generation (through "tools" such as *electronic brainstorming, topic commenter, group outliner*).
b) Idea organization (through tools such as *idea categorization*, *issue analysis,* and *whiteboard*),
c) Prioritising (through *e-voting*, *alternative analysis*, and *on-line questionnaire*).

d) Policy development (through *policy formulation,* and *stakeholder analysis*).
e) Session control (through *agenda* and *session manager*);
f) Management of common knowledge resources of the group (through *opinion calibration / opinion meter*, *handouts*, *whiteboard, group dictionary*, and *list of participants*);
g) Management of individual resources (through *event monitor*, *personal log,* and *briefcase*).

A well-known GDSS product family is *GroupSystems* (www.groupsystems.com) of GroupSystems.com (former Ventana Corporation.). This was taken as reference model for the standard set of supported activities and tools given above. Other well-known products with complet sets of tools are *Consensus@nyWARE* (formerly named *TCB Works*) that was developed at Georgia University and it is offered at present by Softbicycle and *Facilitate.com* of the firm with the same name (http://www.facilitate.com). Other software products show a limited set of tools such as *Impact Explorer* of Banxia Software (www.banxia.com).

Advantages and Limits

The main advantages of sessions supported by G [D] SS over traditional meetings are:

a) Ability to carry out “any time – any place" [virtual] meetings that allow for the participation of the persons most adequate for the aims and scope of the FTA work.
b) Anonymity of inputs that permits avoiding possible individual inhibition and “groupthink”.
c) Parallel communication that leads to an increased productivity and participation of the people involved and shorter meeting times.
d) Automated, complete and error – free record keeping that overcomes the information loss problem.

There are also several disadvantages associated with the use of G[D]SS in FTA works such as: (1) lack of nonverbal cues of the written interventions, (2) high costs of good (complete) G[D]SS, (3) learning curve, in spite of the user friendliness of the software, (4) poor typing skills of some participants.

Conclusions

This paper was a plea for the use of IT tools in futures research works. It was shown that even the simple IT tools such as browsers and e-mail were effective when such research was to be carried out in a short time period with a limited budget. Those tools facilitated the identification of issues (through environmental scanning), extrapolative activities (such as Delphi survey), and the creative ones (such as scenario production).

It is expected that the use of the more advanced group support systems will facilitate, to a greater extent, communication, information sharing, development of mutual understanding, and alternative analysis abilities that are needed to effectively use creative and prioritisation formal methods in FTA works.

It is intended that such IT tools be utilized in the new project of the Romanian Academy the aim of which is to identify the various risks that might show up in Romania in the next ten years and evaluating the ways to prevent disasters or control losses and recover from disasters.

Note. *This paper is based on F.G. Filip et al. (2004) - IT Tools for Foresight Studies. In "Studies in Informatics and Control", **13**(3): 161-168. An early version was presented at the EU–US Seminar an New Technology Foresight, Forecasting &Assessment Methods (Seville, 13–15 March, 2004).*

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