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FORESIGHT SYSTEMS AND CORE ACTIVITIES
AT NATIONAL AND REGIONAL LEVELS
IN FINLAND 1990–2008

Developing Foresight Systems for a Better Life in
Finland and Europe

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CONTENTS

- ABSTRACT 6
- 1. INTRODUCTION 7
- 2. FORESIGHT SYSTEMS IN FINLAND: RECENT DEVELOPMENTS AND ACTIVITIES 10
 - 2.1. The Futures Committee in the Finnish Parliament: Current situation analysis..... 15
 - 2.2. National Foresight Network of the Ministries..... 18
 - 2.3. The Finnish approach to labour market forecasting (Long term model) and the anticipation of educational needs (Mitenna model) 21
 - 2.4. National Foresight Forum of the Ministry of the Trade and Industry 23
 - 2.5. Finnsight 2015 Science and Technology Foresight (SITRA and the Finnish Academy) 25
 - 2.6. The Education Intelligence Foresight System (The Confederation of Finnish Industries) 28
 - 2.7. ETLA Economic 5-year Regional Forecasting System (The Research Institute of the Finnish Economy) 31
 - 2.8. Tekes foresight systems and technology policy activities (The National Technology Agency, Tekes) 33
 - 2.9. VTT's foresight systems 35
 - 2.10. SITRA's foresight systems 37
- 3. REGIONAL FORESIGHT SYSTEM IN FINLAND 39
 - 3.1. Foresight activities and methods at regional level 39
 - 3.2. Current strategically important regional foresight activities 40
 - 3.3. The study of the need for workforce and training (the TKTT model) 42
 - 3.4. Occupation barometer 48
 - 3.5. Regional cluster analyses..... 49
- 4. FINNISH FORESIGHT SYSTEM: SOME GENERAL OBSERVATIONS 54
- 5. SUMMARY 58
- REFERENCES 60

ABSTRACT

Foresight is neither prophecy nor prediction. According to Godet (1993) foresight consists of three critical elements: (1) anticipation, (2) appropriation and (3) action. In the European FOREN project a fully-fledged foresight model was introduced. According to this fully-fledged foresight model the critical elements of foresight activities are (1) the foresight methodologies, (2) networking (3) a shared vision and (4) strategic decision-making (FOREN Guide 2002). It invites us to consider the future as something that we can create or shape, rather than as something already determined. According to FOR-LEARN (2007) in the Foresight On-Line Guide (http://forlearn.jrc.es/guide/1_why-foresight/characteristics.htm) there are four foresight principles: (1) action orientation, (2) an openness to alternative futures, (3) the use of participatory methods and (4) a multidisciplinary research orientation. These principles are correct, but in the reality of governmental and organisational activities it may be difficult to follow these principles without more coordinated national and European activities. The survey report evaluates Finnish activities in the foresight field and presents some promising ideas and models for the foresight focusing on the economy, working life, technology, labour market and also educational skills and needs.

In the summary section the authors discuss the current challenges of the Finnish regional and national foresight systems and activities and use the theoretical frameworks of foresight as a framework for discussion. One key conclusion is that the four principles of foresight presented by the FOR-LEARN network should be taken more seriously when foresight systems are developed in Finland and elsewhere. Also, it is argued that a recent new methodological innovation called Adaptive Foresight Methodology should be brought into wider use in European foresight research. The authors also point out that the elements of appropriation and action are often missing from many foresight activities. The result is that many foresight projects are anticipatory oriented but the serious appropriation phase and, more often, the action phase are often neglected within Finnish national foresight processes. It is suggested that one practical reason for this problem could be the complex nature of emerging social and technological networks.

The authors conclude that dialogue and appropriation in on-going foresight projects are becoming more challenging because of the globalisation process, which is having an impact on various social, economic, technological, environmental, political and value systems. The rapid changes are seen as problematic as they hinder and move too fast for wider social dialogue. Thus many national and regional foresight processes are becoming trans-boundary foresight processes in response to the globalisation process. With regard to the Lisbon strategy the authors conclude that the foresight projects should launch at national, regional and local level such activities, which promote the achievement of the objectives of the Lisbon strategy; economic growth, full employment, social cohesion and governance. Furthermore, there are a great deal of requirements for international foresight co-operation. The Finnish experience clearly indicates that foresight activities should be focused on critical and challenging fields, which are (1) education (competence and qualification foresight studies, future education needs etc.), (2) labour markets (future skills and practical future challenges in the labour markets), (3) innovation systems (technology and science foresight) and (4) the logic of networking (so called cluster foresight studies).

1. INTRODUCTION

The aim of the article is to elaborate upon and describe the recent Finnish national and regional foresight systems and core activities in Finland. The second aim of this paper is to reflect on how foresight research should be promoted at a place of work and in research on work.

The general view on the future of employment is dichotomous as noted by Williams (2007, 6–8). These visions are defined in tables 1 and 2.

Table 1. Dichotomous visions of futures for employment (Williams 2007, 7)

Nature of change	Old	New
Sector-based	Industrial society	Post-industrial
		Knowledge economy
		Information economy
Employment practices	Fordism	Post-Fordism
Organisational	Bureaucracy	Post-bureaucracy
	Compliance	Commitment
	Direct control	Indirect control
	Hard human resource management	Soft human resource management

Table 2. Dominant visions and counter-visions of the future of work (Williams 2007, 8)

Dominant visions	Counter-visions
Formalisation	Informalisation of welfare: third way visions of work, post-employment vision
Commodification	De-commodification of employment, non-capitalist visions of work, post-capitalist visions of work
Globalisation	Localisation of work and welfare, green visions

These visions give us a broad overview of the future of work life and the workplace. Accordingly, we are likely to see a mosaic picture of work life in the future as there are multiple drivers of accelerating change. The multiple drivers that are familiar to work life researchers include:

- § rapid economic and cultural globalisation,
- § a shift from an energy-based industrial economy to a service and knowledge economy,
- § the emergence of the “knowledge society”,
- § technological innovation as a consequence of the confluence of the GRIN technologies (genomics, robotics, informatics and nanotechnology),

- § accelerating urbanization,
- § shifting age demographics,
- § radical changes in geopolitics and
- § environmental pressures including climate change.

These listed drivers are typically in transition process, both directly and indirectly, as well as, work life and work organisations, everywhere not just Finland. In Finland foresight systems have been developed systematically for two decades. Foresight has typically focused on technology, innovations, work life and educational issues. In particular, special attention was paid to Finnish foresight practices and activities after the deep economic recession of the early 1990s. During the years 1995 to 2000 many resources were allocated to foresight research. The critical driving force in this development work was the European Social Fund who sponsored many national, regional and local foresight projects (176 projects, 17 million € in the years 1995–2000). After the active development phase of the foresight research work some evaluations were made. This study summarizes the insights of those evaluations and defines the key foresight processes established during that development phase.

The key foresight processes described in this study are national foresight processes and the most important regional foresight processes. They include:

- (1) The Futures Committee in the Finnish Parliament.
- (2) National Foresight Network of the Ministries,
- (3) MITENNA labour training and education needs 2020 foresight system,
- (4) National Foresight Forum of the Ministry of the Trade and Industry (MIT ¹),
- (5) Finnsight 2015 Science and Technology Foresight (SITRA ² and the Finnish Academy),
- (6) Education Intelligence Foresight System of the Confederation of Finnish Industries (EK),
- (7) ETLA Economic Five Year Regional Forecasting System (Research Institute of the Finnish Economy),
- (8) Tekes ³ foresight systems,
- (9) VTT ⁴ foresight systems and
- (10) SITRA foresight systems.

At the regional level of foresight systems the following systems are described: (1) Foresight system of the Finnish TE Centers ⁵, (2) Regional cluster modeling and the foresight system, (3) Surveys on the Need

¹ At the beginning of year 2008 the Ministry of Labour and the Ministry of Trade and Industry merged to create The Ministry of Employment and the Economy (MEE).

² The Finnish Innovation Fund.

³ The Funding Agency for Technology and Innovation.

⁴ Technical Research Centre of Finland.

⁵ Employment and Economic Development Centres (TE-Centres) are the regional service centres of the MME while agricultural, forestry and fishery are dealt with by the Ministry of Agriculture and Forestry. The main tasks of the TE Centres are to support SMEs, to promote the technological development of enterprises, to implement regional labour policies, to plan and organise adult training and to promote farming, fisheries and rural enterprise activities.

for Workforce and Training (TKTT Foresight Model) and (4) Sub-regional special foresight processes. In Finland foresight activities have focused on some critical themes:

- § Education and training needs,
- § the demand for labour,
- § changes in qualifications and the competences of the labour force,
- § changes in different business fields and clusters and business life in general,
- § technology foresight,
- § demographic structures,
- § globalisation impacts and
- § innovation systems.

From 2001 to 2008 special attention has been paid to the cooperation of different actors and agencies and the utilisation of the results of foresight projects and activities. Many new interesting projects are in the planning phase. A short report concerning these key projects is presented in this article.

2. FORESIGHT SYSTEMS IN FINLAND: RECENT DEVELOPMENTS AND ACTIVITIES

A number of foresight studies have been carried out under the auspices of the former ⁶ Ministry of Labour and the Ministry of Education, often co-financed by the European Social Funds (ESF). The Finnish National Board of Education also administrates a foresight database and Internet-based foresight knowledge service (ENSTI) with the focus on future education and labour demand. The ENSTI system is nowadays widely used by planners of education in Finland (www.oph.fi/SubPage.asp?path=1,443,3086,3987). The Committee for the Future in the Finnish Parliament plays an important role in raising awareness and the level of knowledge of the Members of the Parliament (www.eduskunta.fi) by providing them with a broad-scope future outlook and more focused future-oriented technology assessments. The Committee for the Future also prepares Parliament's response to the Government's Report on the Future during each electoral period.

In Finland, the former Ministry of Trade and Industry initiated a pre-study "On the Road to Technology Vision", which it coordinated together with Tekes (The National Technology Agency) from 1996 to 1997 (see KTM 1997). After the project the Ministry commissioned an assessment report on the present state and development needs of Finnish foresight activities. The report recommended a clear institutional framework for foresight work and the better coordination of the diverse activities that contribute to forward thinking (Salo 2001). As a result, the Ministry of Trade and Industry launched a four-year foresight development and coordination project in 2001 with a relatively modest budget (see www.ennakointifoorumi.fi). Unfortunately, this foresight forum will be closed in the end of year 2008.

In addition, public sector organisations, such as The Academy of Finland, Tekes and SITRA (Finnish National Fund for Research and Development) are important foresight actors as well. In the recent national FinnSight 2015 exercise (www.finnsight2015.fi), the Academy of Finland and Tekes combined their efforts in support of the priority setting of basic and applied research in Finland. In parallel, SITRA started its own foresight exercise in the form of a national foresight network in late 2005. The aim of this foresight work was, instead of concentrating in in-depth analyses, to recognise the changing trends and crucial future challenges to which decision-makers should pay serious attention. (FinnSight 2015). All these activities are to be summarised and co-ordinated on SITRA's Foresight Forum (www.foresight.fi) launched in November 2008. The previous foresight activities of the MIT (the National Foresight Forum) will probably be integrated into this national forum.

⁶ See footnote 1.

In Finland, a number of sectoral and regional foresight studies have been carried out by VTT (Technical Research Centre of Finland), Finland Futures Research Centre, The Systems Analysis Laboratory of Helsinki University of Technology, The Lahti Centre of the Helsinki University of Technology, Lappeenranta Technical University and other university research groups. These actors have also contributed to various types of strategy workshops that have also been partly organised for educational purposes. VTT has also been actively involved in technology road-mapping processes carried out internally or in cooperation with industrial federations and international consortia. In addition, considerable effort has been put into the societal embedding of innovations and new technologies (Kivisaari et al 2004). Furthermore, foresight studies that focus on specific topics, are typically carried out as a collaborative work by sectoral research institutes, academic researchers and private consultants. On the educational side, a Graduate School in Future Business Competencies (TULIO), which is coordinated by Finland Futures Research Centre and Finland Futures Academy, was established in 2005/2006. VTT and Finland Futures Research Centre are also active partners in Nordic and European foresight cooperation. Shared Nordic foresight analyses have also been made on the basis of Nordic foresight research. (Andersen, Borup, Borch, Kaivo-oja, Eerola, Finnbjörnsson, Överland, Eriksson, Malmer & Mölleryd 2007)

Based on the experiences gained from the Nordic Foresight Forum and its large foresight study a large list of policy recommendations was presented to the Nordic Innovations Center (NICE, www.nordicinnovation.net). Many of these recommendations are relevant for cooperation with regard to foresight research on the future of working life.

Recommendation 1: Use foresight to strengthen the Nordic Research and Innovation Area and increase the weight of Nordic countries in European discussions. The Nordic countries are a unique group of countries in a globalised world. In practice, this could mean creating opportunities and the foundations for bilateral and multilateral Nordic co-operation on foresight. Nordic actors working within NICE can initiate foresight activities to identify bases for joint efforts aimed at participating proactively in European foresight exercises and European socioeconomic policy-support activities, and even in the design and implementation of European innovation policy more generally.

Recommendation 2: Discover possibilities for Nordic added value in foresight exercises. There is evidently much potential added value in Nordic co-operation. However, research and development (R&D) activities are needed to discover the best possibilities for Nordic added value. Discussions on the Nordic Foresight Forum indicate that we need more Nordic stories, although current first foresight projects funded by the NICE are creating such Nordic stories.

Recommendation 3: Broaden the scope to the Baltic area. Nordic foresight activities should have a broader context. "Nordicness" or "Balticness" should be understood in a global context. Nordic foresight activities can include actors from the Baltic Sea and Barents regions. An important future challenge is co-operation with Russia, which currently presents a window of opportunity that could be beneficial for all concerned in the long run. In the future such activities could promote the creation of a Baltic Sea Research and Innovation Area. One obvious partner in this kind of process could be the Baltic Economic

Forum (BEF) on Economic and Social Development in the Baltic States (see e.g. www.balticeconomicforum.com).

Recommendation 4: Adopt the principle of rolling priorities and adaptive foresight. The Nordic countries could benefit from a limited number of clear priority areas of cooperation. These priority areas should be fixed for a certain period, but with space for emerging areas and topics as older ones are sufficiently covered. This principle of rolling priorities could help Nordic countries to adapt in the globalised world economy. In some special areas one Nordic country is always a leader and other Nordic countries can learn something from such advanced knowledge. This kind of idea could help to create strong synergy between national and pan-Nordic policy interests. This suggestion can be connected to E. Anders Eriksson's and Mathias Weber's Adaptive Foresight Mode (Eriksson and Weber 2008). Adaptive foresight has been developed at the crossroads of foresight and adaptive strategic planning. So far it has focused on technology and innovation policy. From foresight (and related types of contemporary perspectives on innovation) it has inherited a flavour for the broad and multi-disciplinary exploration of the increasingly complex, interdependent and uncertain realms of today's business and policy strategy. In addition, it suggests that the adaptive planning paradigm provides a natural starting point for navigating the complex landscape of policy strategies.

Recommendation 5: Initiate post-projects to mitigate the dilemma of projects being closed too early. Projects often generate a lot of interest, nationally and internationally, but when a project is completed no resources are left to follow up on this interest. Post-project activities would include participating in seminars and reformulating results for other relevant audiences. One way to solve this dilemma is to organize smaller follow-up activities such as interactive seminars, workshops, retargeting final reports and publications, and reformulating findings based on new input. This could be arranged administratively by the NICE (Nordic Innovation Centre) through smaller so-called post-projects or dissemination projects (or even a series of projects) like the present pre-projects or planning projects. The same tool could be used for rolling priorities.

Recommendation 6: Monitor procedures for Nordic foresight activities systematically and liaise with the European Foresight Monitoring Network (EFMN). To facilitate this a systematic scanning procedure for Nordic (Baltic), national, regional and sectoral foresight exercises should be created. The next phase of the Nordic Foresight Forum should include the dissemination of Nordic foresight activities and experiences as briefings to the EFMN. This would benefit European foresight discussions and ensure a Nordic impact on these discussions. Information should also flow in the opposite direction and utilise the EFMN to identify relevant new Nordic foresight exercises.

Recommendation 7: Initiate a systematic procedure for generating and assessing good ideas and topics for Nordic co-operation on foresight. The following illustrative and tentative list of ideas for new Nordic foresight projects is based on discussions at the Tampere and Stockholm workshops and on the Internet questionnaire of the Nordic Foresight Forum.

- § The future of innovation in the Nordic social model; this is a broad foresight theme that could encompass many others. In particular it features the two aspects on how Nordic social models may enable innovation and may be supported by innovation.
- § Nordic Energy Foresights; these could be seen as a continuation of the Hydrogen Energy Foresight with much of the same type of Nordic added value.
- § From the Common Agricultural Policy to bioenergy and R&D funding: studying the potential implications for the Nordic countries, if (some of) the funding for the EU Common Agricultural Policy is shifted to support bioenergy production and R&D.
- § Nordic security foresight; this could comprise both Nordic and European homeland security, the Nordic contribution to global stability and security, and develop the security industry within the Nordic market.
- § Nordic services foresight(s); examples include; education, health care and services for the older people, both as part of the Nordic social model and as a (potentially) globally competitive Nordic industry.
- § Nordic remote-areas foresight. We propose the starting of a pilot study on possible themes for Nordic foresight regarding remote regional areas. The overall aim would be to produce one or two foresight programmes on the issue.

It is recommended that Nordic foresight projects cover different regional areas, and include a minimum of two countries or more.

Recommendation 8: Finally, we suggest prolonging and increasing Nordic Foresight Forum activity. So far, the regular meetings (every 6 months) and especially the more committed effort in the work packages has proven to be a strong mechanism for both formal and informal networking and the exchange of experiences and knowledge. It has also created a solid basis for further European cooperation. The minimum aim of the forum is to meet every 6 months, but our experience of other similar international networks is that without tasks to perform together, networks erode quickly. The strongest network-creating mechanism is to work together on an actual task, meet deadlines and produce common results. One of the main purposes of the network is to learn, to exchange practices and to gain experience from foresight activities and their impact on decision-making and policy in Nordic countries.

These recommendations are useful background information when we discuss the future of work life and work places. These Nordic recommendations are also relevant for the wider European research agenda. For the European context we present two important recommendations.

Recommendation 9: A key foresight research field challenge is to develop a European Foresight Monitoring Network (see EFMN 2008) and its current knowledge management systems to include the foresight of work life issues in a more integrated way. This would entail the creation of more joint European forums to analyse the very latest European foresight monitoring results, with respect to their relevance for European work life.

Recommendation 10: A further challenge is to connect the various ambient innovation research activities and tools of the European Union (Inno-Policy TrendChart, Inno-Nets, Inno-Actions, Inno-Grips, Inno-Learning Platform etc.) (see PRO INNO Europe 2008) in order to form more systematic work life research and foresight programmes, which are based on the very latest research findings on innovation.

Finnish experts and foresight agencies have conducted much beneficial European cooperation in the context of COST A22 (CORDIS Foresight methodologies network, www.costa22.org/mou.php), the European Foresight Monitoring Network (EFMNm, www.costa22.org/mou.php), the For Society network (www.eranet-forsociety.net/ForSociety/index.html) and FUTURREG (www.futurreg.net). These European foresight field projects have usefully focused on methodologies and the dissemination of foresight activities.

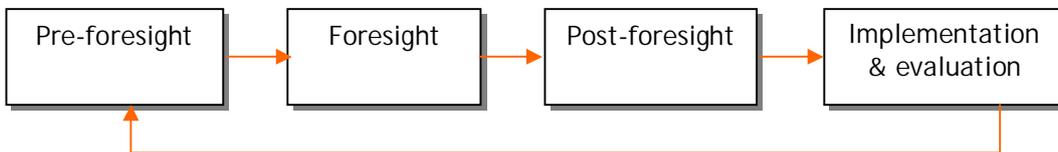


Figure 1. The foresight process.

Typically these projects have described new methodologies for managing the foresight process (Fig. 1, see e.g. Keenan, Loveridge, Miles and Kaivo-oja 2006). The most established European foresight effort has been the FOR LEARN project (<http://forlearn.jrc.ec.europa.eu/index.htm>). Becker (2002) presents a good overview of European organisational corporate foresight research. It is important to understand that the use of foresight methodology is different in private corporations, small companies and public sector agencies. Typically public sector agencies can use heavier administrative processes and longer processes when they implement foresight activities. In companies and corporations processes must be more flexible and faster. If companies and corporations make larger foresight processes, they typically focus on clusters and markets in their analyses.

One very important recent methodological progress has been so called Adaptive Foresight Methodology. This methodology has been used in many contexts and was tested in Finland during the Finnish regional Satakunta Foresight project. Adaptive Foresight Methodology has been developed at the crossroads of foresight and adaptive strategic planning. In this methodology innovation is seen as increasingly complex, interdependent and uncertain and therefore in need of broad and multi-disciplinary exploration and participation. The adaptive planning paradigm provides a natural guide for the navigation of this complex landscape. Hence it asks whether strategic decisions should be deferred until more information is available and simultaneously whether to invest in (real) options which would facilitate the implementation of such decisions, if taken at some future time. Compared to conventional foresight, Adaptive Foresight thus favours a more modest interpretation of the collective ability to “shape the future” and stresses the need to adapt to actions by others. Here it is equally important to be able to exploit the upside of uncertainty as to abate its downside. (Eriksson & Weber 2008)

2.1. The Futures Committee in the Finnish Parliament: Current situation analysis

The Parliament of Finland has wished to assume an active role in the discourse on the future of the nation. It has obliged the Finnish Government to submit a report on the future once each parliamentary term. In it the Finnish Government defines its perception of the country's future and of the measures that will be needed over a time span of 5 to 15 years. The Finnish Parliament has appointed a Committee for the Future to deliberate and reply to the Government's report. Parliament deliberates the Committee's report in session and adopts it with any amendments that have been made, whereupon it becomes a resolution of Parliament binding on the Government.

Parliament received the first report on the future in 1993. The Committee deliberated and replied to the report the following year. This time, the Government's report on the future is in two parts. The first, "Finland and the Future of Europe", was submitted to Parliament in autumn 1996 and the second, "Fair and Bold – A Finland of Responsibility and Expertise", which concentrates on Finland, in April 1997 (Tulevaisuusvaliokunta 1998). This report by the Committee is its response to the first part of the Government's report. The Committee outlined the factors on which future success will be based and proposed measures, which Parliament approved during the session at which the Committee's report was deliberated. The Committee hopes its report will prompt an open and inspiring discourse on social models. We urge Finnish decision-makers to follow developments not only in Europe, but also in the rest of the world. By comparing present models with those looming on the horizon, Finland must choose and carve out a road to be followed as passively waiting is seen as dangerous.

One method that has been developed in Finland is the presentation by the Government of reports to Parliament. Rather than introducing legislation in Parliament, the Government submits a report on important social matters, such as rural development, energy policy (including the construction of nuclear power plants) and participation in the European Monetary Union (EMU). This means that problems can be discussed within a wider context than legislative proposals permit and, above all, in good time, i.e. when they are of topical relevance or can be pre-emptively influenced.

Dialogue between the Government and Parliament in the case of reports follows largely the same lines as with other legislative drafting. After a general debate in the chamber, the matter is referred to special committees for deliberation. The committees hear the views of experts and draft a report, which is presented in session. There it is either adopted or rejected, in addition to which riders or demands that the Government undertake certain measures can be attached either unanimously or following a vote. However, a report cannot serve as a basis for a parliamentary vote of confidence in the Government.

Current policy making challenges are the main interest of the Finnish Futures Committee. The Futures Committee has produced the following reports and papers for Parliament, which are available at: <http://web.eduskunta.fi/Resource.phx/valiokunnat/valiokunta-tuv01/index.htx>.

- § Report 1: Plant gene technology report I (1987)
- § Report 2: Knowledge and communication technology in education report I (1998)
- § Report 3: Plant gene technology report 2 (1998)
- § Report 4: Knowledge and communication technology in education report II (1998)
- § Report 5: Gerontology, ageing population and technology report (1999)
- § Report 6: Integrated knowledge management report (2001)
- § Special Report: Knowledge Management in the Parliament of Finland (2001)
- § Report 7: New Internet technologies supporting ageing people. A social impact report (2001)
- § Report 8: Gerontology, Internet and ageing people: Final report (2001)
- § Report 9: Gerontology and futures policy (2001)
- § Report 10: Renewable energies 2030. A Delphi report (2001)
- § Report 11: Social capital and media technology developments report (2002)
- § Report 12: Renewable energy up to 2030 report (2002)
- § Report 13: Regional innovation systems in Finland: Development challenges report (2002)
- § Report 14: Social capital and information technology (2003)
- § Report 15: Regional innovation systems and development challenges report (2003)
- § Report 16: Human genome research challenges for decision-making (2003)
- § Report 17: Technology evaluation activities in the Finnish parliament (2004)
- § Report 18: Caring, motivating and creative Finland: Challenges of knowledge society (2004)
- § Special Report: Challenges of the global information society (by Pekka Himanen) (2004)
- § Special Report: Information technology supporting the formation of social capital (2004)
- § Report 19: Management of innovative environments and organizations (2004)
- § Report 20: Futures of the Finnish health care system (2004)
- § Report 21: Det intresserade, stimulerande och kreativa informationsområdet – Finland inför framtidens utmaningar (2004)
- § Special Report: Technology Assessment – A Comparison of Finnish Practices and the Practices of the five EPTA Institutions (By Osmo Kuusi) (2005)
- § Report 22: Social capital I (2005)
- § Report 23: Social capital II (2005)
- § Report 24: Regional innovative environments I (2005)
- § Report 25: Regional innovative environments II (2005)
- § Report 26: Report and Memorandum: Keeping up with change. Background memorandum for the Committee's response to the Government report on population policy. (by Paula Tiihonen) (2005)
- § Report 27: Report: Finland, decide to succeed! A background polemic on innovation policy. (by Pertti Monto) (2006)
- § Report 28: The Future of Health Care. Background information concerning the Finnish health care system in 2006 and some basic concepts used in the position of the Committee for the Future (2006)
- § Report 29: Democracy and Futures. (By Mika Mannermaa, Jim Dator and Paula Tiihonen) (2006)

- § Report 30: Democracy in Futures (Mika Mannermaa)
- § Report 31: Russia 2017: Three Scenarios. (By Osmo Kuusi, Hanna Smith and Paula Tiihonen) (2007)
- § Report 32: Many democracies. A celebration seminar book in honour of Kauko Sipponen 25.4.2007. (By Paula Tiihonen and Risto Harisalo) (2007)
- § Report 33: Forests and forest know-how as Finnish competitive strength. How to respond to climate change and changing global market changes? Technology Assessment Report 25. (By Juha Honkatukia and Osmo Kuusi) (2007)
- § Report 34: Eyes open. Threats and Possibilities of the Knowledge Society. Special Report of the Futures Committee 1/2008. (By Ville Eloranta)
- § Report 35: Metropolies, Asia and basic education: Special report of the Futures Committee 3/2008. (By Paula Tiihonen and Osmo Kuusi)
- § Report 36: Possibilities and Risk of Nanomaterials. Technology Assessment Report 26. (By Merja Itävaara, Markus Linder and Esko Kauppinen)

These publications reveal that the Futures Committee has covered a variety of topics in its work. The renewal of society is not possible unless there is a national drive and a common goal. Thus far, Finland has shown a great capability for renewal and survival after facing serious crisis situations in the past. Nevertheless, that same power and energy needs to be mobilised in more auspicious circumstances. However, current strategies seem to have stagnated and lack a collective steering and inspiring vision. The current conclusion is that Finland needs a new inspirational national vision. (Stähle 2007)

Acquiring distinction in the international arena is becoming increasingly difficult. It can only be accomplished through an authentic national identity and distinctive features. Although Finland possesses many such features, especially through its nature, technology and culture, national strategies ignore the potential of Finnish identity and values, which should be the cornerstones for the foundation of successful Finnish development. Finnish strategy papers have focused on describing its expertise and development, which is important as Finland is a globally interesting success story. However, this could be better conveyed to the rest of the world. (Stähle 2007)

Current futures analyses concerning Finnish society and economy have shown that informal networks and network institutions are wielding increasingly more power and the trend towards this so-called soft power will become progressively stronger in the future. This has great potential for Finland because, being a small and homogeneous country, it has the versatility to assimilate change rapidly. Social capital is strong in Finland in terms of interpersonal trust and lack of corruption. On the other hand, being a relatively new actor on the international scene, Finland's relation capital in the international flows of knowledge, finance and consumption is not very well developed. Success in the contemporary network economy is increasingly dependent on communication. However, Finnish identity and culture are very much based on things other than communication, the development of which presents a significant challenge for Finland on the playing fields of the world economy. (Stähle 2007)

The Finnish national innovation system has received a lot of praise. However, the roots of innovation and entrepreneurship lie deeper in the social fabric and practices than Finnish knowledge and innovation strategies seem to understand.

The foundation for innovation and entrepreneurial spirit is instilled in individuals at a very early stage, and schools are a crucial factor in this development. Another crucial aspect is management in all organisations, because it is the facilitating factor that allows individual creativity, innovation and entrepreneurial inspiration to develop into a national economic and social resource. These roots should be incorporated into the Finnish national innovation system. (Stähle 2007)

Finland has a unique time window for assuming the role of pioneer in the application of ecological technology and practices. Finland also has the potential to become a worldwide brand by developing itself to function as a laboratory in this field. Finland has been a pioneer in technology and a laboratory for the information society, attracting a great deal of interest from across the world. Now is the time to re-create that phenomenon in a new area, one in which the attention of the whole world is focused. Finland would be particularly appropriate country for this role, because its awareness of environmental issues and the quality of its environmental technology are particularly high. (Stähle 2007)

2.2. National Foresight Network of the Ministries

The Government Foresight Network consists of representatives from all ministries and the Prime Minister's Office. The members of the network are those responsible for foresight activities within the different ministries and the Prime Minister's Office. (Valtioneuvoston ennakointiverkosto 2005a)

The network's main objective is to coordinate the ministries' foresight activities. In addition, the Network wishes to develop the ministries' foresight processes, promote foresight activities at the regional level and ensure that the outcomes of foresight processes are put into use in policymaking. In short, the Network functions as a discussion forum and as a medium of cooperation between ministries. (Valtioneuvoston ennakointiverkosto 2005a)

The Network was appointed in March 2004 by the Ministry of Labour and is also chaired by the Ministry of Labour. The Network was proposed to be active until May 2007. In Table 3 the main governmental levels and their characteristics within foresight activities are described.

Table 3. *Foresight in the Finnish governance (Salo 2001)*

Governmental levels	Characteristics
National level	<ul style="list-style-type: none"> § The basic idea is to support and develop national innovation systems § Covers various governmental sectors and policy fields § All the relevant stakeholders are in dialogue
Sectoral or institutional level	<ul style="list-style-type: none"> § Evaluates the futures perspectives of different sectors from the point of basic ideas of governance § Supports the up-dated strategies of different sectors § Produces good ideas for the planning and the operation of different sectors
Action level	<ul style="list-style-type: none"> § Interprets the main ideas of sectoral strategies from futures perspective § Produces effective implementation plans § Clarifies sector strategies in real life contexts

All the details of the sectoral foresight models were analysed and published in one large integration report in 2005 and a second knowledge management report (Valtioneuvoston ennakointiverkosto 2005a, 2005b). This integrative project considerably clarified the main functions of national foresight activities.

Why do we need such a network?

Every ministry is responsible for conducting foresight activities concerning its own branch of administration. The objective of the Network is to bring together the different views of the ministries in order to create a uniform, comprehensive view on the future.

This was done in practice in 2005 by integrating the different views of the ministries to form a single report (Joint Assessment of the Future Operating Environment, currently available only in Finnish). The report can be used in the ministries as a resource paper for preparing e.g. the Government Report on the Future for Parliament. The primary foresight activities are nevertheless still conducted by the ministries.

How does the Network operate?

The Network operates flexibly. Meetings are held when necessary. So far there have been about 5 to 7 meetings per year. In addition to coordinating the foresight activities between ministries, the Network keeps in contact with research institutions engaged in foresight activities. The Network has, for example, become familiar with Sitra's (The Finnish National Fund for Research and Development) foresight project as well as the Foresight Forum of the Ministry of Trade and Industry and Tekes (The Finnish Funding Agency for Technology and Innovation) and the Academy of Finland. In June 2006, the Network visited the Parliament Delegation of Finland to the OECD in order to discuss some topical foresight-related issues.

National Foresight Forums

Every year the Network organises a so-called Foresight Forum. The forum functions as a medium of societal discussion between ministries, regional and local governments and labour market organizations. The first forum, "Labour markets in 2010" was organised by the Ministry of Labour in autumn 2004. In 2005, the theme of the forum was health, working capacity and social safety. The next foresight forum was organised in February 2007. The theme was "Foresight from the point of view of the regions". These kinds of Foresight Forum models have been quite useful from the point of view of national ministry co-operation and in creating public-private partnerships.

Key reports

The Foresight Network has published two reports, both in the year 2005. The first report "The Government Foresight Network and Foresight Activities within the Ministries" describes the foresight processes in the ministries and gives some background information about the Network and its role in these processes. The second report "A Joint Assessment of the Future Operating Environment" is a joint assessment concerning the development of the operating environment within the next 10 years. The report brings together different views on the future covering all branches of administration. Both reports are currently available only in Finnish.

Thus, methods for anticipating the future have been developed further and development work is still continuing. In Finland, the anticipation of labour and educational needs is strongly connected to decision-making, which is highly participatory as it includes various actors from different fields and levels of administration. This is also indicated by the setting up of the Foresight Network, the tasks of which are e.g. the coordination of foresight and the improvement of foresight skills and interaction between central, regional and local administration.

The next phases of the project are still open, but some kind of ministry level cooperation will be continued. The National Foresight Network of the Ministries operated from March 01, 2004 to May 31, 2007 under the Ministry of Labour. In 2008 a new coordinating ministry the Ministry of Education will take over its role.

2.3. The Finnish approach to labour market forecasting (Long term model) and the anticipation of educational needs (Mitenna model)

The Long Term (LT) model is a macroeconomic model for assessing the impact of economic growth on employment. The goals of the LT model are twofold. First the model will anticipate the labour force supply and the demand for employment as required by different industries (over 30 industries).

The supply for labour is determined by population forecasts (source: Statistics Finland) and participation rates. The demand side of the LT model uses data on production, labour productivity, hours worked and the number of employed. The interaction of the two sides of the model generates projections of unemployment. A distinction is made between the 'basic' scenario (which describes the most probable path of the labour market), and the 'target' scenario (which describes the 'optimal' path if effective policies are pursued to achieve high levels of employment and productivity with high quality jobs in the context of sustainable development). The Ministry of Employment and the Economy will be responsible for the calculations of the model.

The forecasting results of the LT model are used as inputs for the model with regard to anticipating the requirements of the occupations, misuse of available competences and skill needs. The LT model includes scenarios and calculations on alternative development paths for GDP, productivity and employment.

In Finland, the anticipation of educational needs (The MITENNA model) has been carried out as broad-based cooperation between various actors. The main actors in the process in the public sector are the different Ministries, the National Board of Education, State Provincial Offices, Regional Councils and Employment and Economic Development Centres (TE Centres), joint municipal authorities, universities of applied sciences (previously they were called polytechnics), universities and training and educational institutions.

The main tasks of anticipation are:

- (1) to prepare forecasts concerning economic growth and employment,
- (2) to anticipate the medium and long-term demand and availability of the workforce in Finland,
- (3) to forecast the development of occupational structure,
- (4) to anticipate the educational needs of the new workforce and
- (5) to estimate the national and regional intake needs of education for young people.

The forecasts of the labour demand (LT model) are then turned into forecasts for future labour demand according to occupational groups; these include the change in demand (base year minus target year) and attrition (or manpower outflow) of labour. The future educational needs for work are then derived from

this total demand for labour. This process is the responsibility of the National Board of Education and the information it provides is used by the Ministry of Education when preparing the Development Plan for Education and University Research, which is finally adopted by the Government.

The model uses forecasts of labour demand by occupational category to generate estimates of demand by level and sub-field of education, which are, in turn, related to forecasts of the supply of young people coming through the education system. This is done in order to indicate the required intake levels for new entrants to the system in the different fields of education. The outputs of the model are used both directly in planning intakes for the education and training system, and indirectly in providing advice and guidance to individuals (especially young people) who are choosing their educational paths.

The National Board of Education also co-ordinates the foresight process for labour and educational needs, which is made by the Regional Councils and their partners. The Ministry of Education, Ministry of Labour (now the MEE) and Ministry of the Interior, which are responsible for regional development, also participate in co-ordinating that foresight process. However, the Ministry of the Interior will focus only on security issues and not on regional development issues in the future. Regions produce their own forecasts on educational needs in their area based on nationwide forecasts and their own estimates for regional development. This information is then used by the regions themselves in their strategic/visionary planning and by the Ministry of Education when deciding on licences to provide vocational upper secondary education and training and the educational tasks included in the licence. Information is also used in performance negotiations between the Ministry of Education, the universities and the polytechnics when agreeing on their educational provision.

The anticipation of labour and educational needs in Finland has its roots in the 1960s, when the manpower requirement method was assessed as a tool for anticipating educational needs. After that the specific Planning Secretariat that operated under the Ministry of Education prepared several forecasts. At the beginning of the 1990s the political atmosphere placed particular stress on decentralisation and the former centralised system of planning and forecasting was relinquished.

Finland is now facing a completely new situation because of the change in the age composition of the population. The large age groups will leave the workforce at the turn of the next decade and the labour force will begin to diminish gradually. It has been estimated that the young age groups, which are quite small, are not large enough to meet the demand for new labour. Thus, the appropriate dimensioning of education to the different fields and levels of work will become increasingly important. Consequently, the anticipation of labour and educational needs has become an important issue again.

In addition to the activities described here, there are many independent projects that deal with foresight carried out by various interest groups in Finland. They usually focus on the future needs of labour and education in certain occupations and fields of education. In these projects various methods of foresight are used. Typically competence and qualification needs foresight analyses focus on cluster and sector needs.

2.4. National Foresight Forum of the Ministry of the Trade and Industry⁷

Technology foresight can improve our understanding of the impacts of technologies and their framework, as well as support strategic choices between alternative technological development paths, promote the networking of experts, and contribute to the creation of common future-oriented insights and conditions for consensus. Foresight exercises can also give support to the prioritisation of technologies and the allocation of R&D and related resources.

In the autumn of 2001 the Ministry of Trade and Industry launched a development project for technology foresight with the aim of supporting, with means provided by technology foresight, decision-making related to technology and innovation policies. The project promotes discussion on future technologies and their development in Finland. It produces and conveys foresight related information, networks parties interested in the future of technology and develops methods, processes and content for technology foresight. Projects and initiatives related to the main project are started, enhanced and supported as much as possible. The starting point is the view that technology develops in interaction with the ambient world. In other words technology is changing the world, and changes in the world are creating needs for developing technology. A special challenge is to identify nationally significant challenges and possibilities for technological development and innovation. The Ministry of Trade and Industry has developed technology foresight in close cooperation with Tekes (The National Finnish Funding Agency for Technology and innovation), VTT (The Technical Research Centre of Finland) and with Sitra (The Finnish Innovation Fund). The development project for technology foresight aimed at creating active interaction with all organisations and individuals interested in the future of technology. The project collects the views of the various parties on how technology foresight could be further developed in Finland. Feedback, experiences and proposals for development concerning technology foresight can be sent to the project via the Tekes website. (Salo 2001)

Ennakointifoorumi (The Foresight Forum) was a Finnish government supported cooperation platform dedicated to promoting practices that generate, disseminate and utilise information about the future. The Foresight Forum was established at the beginning of 2004, and since then has gained thousands of users. The goal of the Foresight Forum was to serve all the actors, especially in Finland, in any way active in foresight. The co-ordinators of Foresight Forum pointed out that: "We want to be meeting point number one" (Ennakointifoorumi 2007). In the future, SITRA will probably continue the activities of the Foresight Forum (www.foresight.fi).

In Finland, foresight activities are used to create and maintain a reliable picture about probable technological and societal trends, developments in world and national economies, the values of people, environmental issues, and many other relevant topics. Typically the time perspective is 10 to 15 years and

⁷ Probably National Foresight Forum is going to be coordinated by the SITRA.

quite often considerably more. Within the context of the Foresight Forum the basic idea was to try to help various actors understand what those developments could mean for them. The members of the foresight community include people that range from high executives in private and public organisations to single, active citizens observing their surrounding world. (Ennakointifoorumi 2007)

The foresight forum is open to everyone. The members of the Foresight Forum work to bring together the most prominent researchers in the foresight area. This is done by first bringing together Finnish researchers and then, gradually, their colleagues in other countries, as well as their primary customers, especially the people who are responsible for the strategy of their organisations. For the time being, the weight point of operations is local but, naturally, it will actively follow foresight development in other countries, too. (Ennakointifoorumi 2007)

The Foresight Forum working methods include comprehensive virtual communication through the Internet, but also frequent workshops and seminars in order to discuss relevant issues thoroughly via organised human interaction. Thus, it promotes dialogue and networking: The effect has been that new, innovative ideas have increased considerably through this kind of approach. The Foresight Forum hopes that people will find useful information, hints, and channels to Finnish foresight actors by browsing its website. The Foresight Forum adds material in English to its sites whenever interesting publications and news is published. The theme groups of the Foresight Forum, which were used to generate specific understanding in the selected topics, were (Ennakointifoorumi 2007):

- § The effects of aging
- § New service based businesses
- § Biotechnology
- § User friendliness
- § Foresight as a part of management

The current situation in the Foresight Forum is open. The Ministry of Trade and Industries is planning the next phases its operation and other foresight activities. In Finland, it self evident that Tekes, VTT and Sitra should work in close cooperation in the technology foresight field.

As a result of the futures challenges mentioned above many projects of Futures Committee have focused on knowledge, innovation and globalization challenges.

2.5. Finnsight 2015 Science and Technology Foresight (SITRA and the Academy of Finland)

Foresight and its associated horizon scanning centre aims to provide visions of the future in order to ensure effective strategies to the challenges seen in those visions. It does this by providing a core of skills in science based futures projects and unequalled access to leaders in government, business and science. The Finnsight 2015 project is a good example of nationwide foresight cooperation. The Academy of Finland and Tekes aims to use the results of FinnSight 2015 for developing Strategic Centres of Excellence in Science, Technology and Innovation. In Finland foresight activities provide a structured platform for open and insightful discussion about the future among as large a number of people as possible. It can help to detect weak signals, opportunities and threats, to build up a common understanding of important core issues and to identify issues and measures on which decision-makers should concentrate their attention.

According to Finnsight 2015 analyses, the Far East, China and India all have strong emerging economies and science and technology industries. India, in particular, is now rapidly moving into areas where advanced industrial countries used to have a competitive advantage, such as high technology. Closer to home, strong economic growth is expected in the new EU members and Russia. Market success, in the future, can no longer be achieved simply by means of technological innovation, but will require more in depth knowledge of consumers' wishes and choices and an ability to differentiate from other products and services. Globalisation is not only an economic process as it also impacts on social development as well as people's everyday life. As far as the individual citizen is concerned, globalisation means an increased freedom of choice both in education, in the labour market and in consumption. At the same time, the daily life of individuals is increasingly permeated by growing complexity, the increasing vulnerability of business and the economy, instability in the work environment and growing cultural tensions between people. (Finnsight 2015)

The conclusions of the Finnsight 2015 project were interesting. Some of key conclusions were connected to globalisation challenges. According to Finnsight 2015 and its key conclusions, the Finnish innovation environment needs constant access to up-to-date and forward-looking information about the challenges of the global economy and change in its business operation and innovation environments. This makes it easier for a small country to find its own niches by specialising in areas where it is possible to achieve an internationally strong position. At the same time Finland should seek to optimize its resource allocation with a view to boosting welfare and the growth and renewal of business and industry. (Finnsight 2015)

One of the key challenges with respect to environmental management is the simultaneous management of environmental issues at the global and local level, which are closely linked with each other. Globalisation and the liberalisation of world trade are fundamentally changing the framework of environmental management. The trend so far has been towards increasing environmental regulation at the same time as the public sector has assumed a stronger role. According to Finnsight 2015, globalisation will increase

the role of multinational companies. Clean water, forests, and pristine nature are other precious resources that are increasingly turning into critical natural resources. In consequence, policy innovations regarding sustainable development will face a growing demand. There is also greater need for basic research into ecosystems, for the analysis of alternative ecosystem scenarios and for new decision-making methods. Improvements are also needed to current methods for forecasting environmental crises and for methods of environmental management so that the short-term target of an economy's effectiveness does unduly increase risk-taking or overload infrastructures. Finland has strong expertise and competence in all these fields. The integration of environmental know-how in these fields with other areas of expertise offers real potential for creating significant innovations at the product, process, solutions and service level. (Finnsight 2015, 63)

According to Finnsight's 15 analyses, increasing productivity is crucial for Finnish competitiveness. In this regard, the development of services and service innovations as well as ICT applications has key significance. Steps are needed to strengthen the use of global knowledge and cultural know-how in research and innovation. Global risk management has assumed ever greater importance. In particular, there is a growing need for competencies in foresight and risk management related to the economy, environment, energy, infrastructure and health. Energy and environmental issues are of critical importance globally. More investments are needed when developing new forms of energy generation and in the sustainable management of the environment and environmental technology innovations. The management of effective innovation processes is a critical factor that must be further strengthened. (Finnsight 2015, 65)

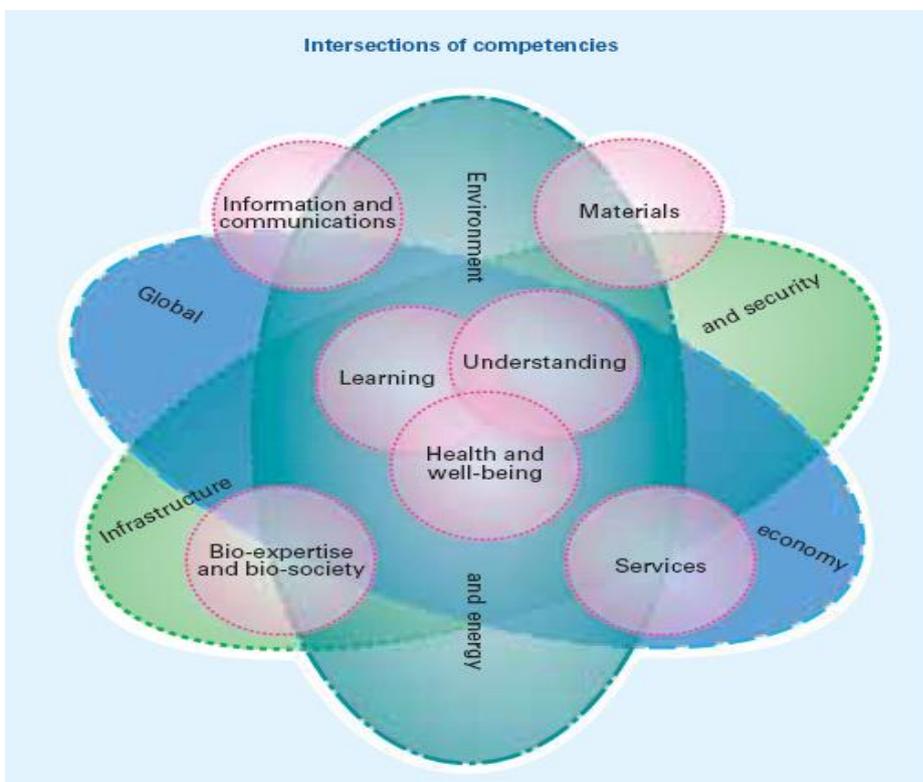


Figure 2. Intersection of competences by Finnsight 2015 (Finnsight 2015, 53)

The Finnsight 2015 project (Fig. 2) founded the following key findings concerning the Finnish economy and society (Finnsight 2015):

1. The export activities of Finland are based on mobile technology and ICT sector. The Finnsight 2015 study indicates that this sector will regress before the year 2015. Thus new industrial strategies are needed.
2. For Finland a future possibility is cross-sectional niche markets, especially in the fields of electricity, paper and pulp industries and machine building.
3. In the future Finland will not be a major industrial player in the energy and climate policy field. This is because China is building up carbon-based energy systems in the near future. Finland will be a marginal player in global energy and climate change policy.
4. In the global markets, there is a major threat that large corporations and companies, which use unsustainable and irresponsible business models, will gain immoderate competitive advantages.
5. Biorefinery is a significant industrial platform. Biorefining refers to the fractionating of biomass into various separated products that possibly undergo further biological, chemical and/or biochemical, physical and/or thermal chemical processing and separation. By means of co-producing relatively (high) value chemicals (e.g. fine chemicals, pharmaceuticals, polymers) the production costs of secondary energy carriers (e.g. transport fuels, heat, power) potentially could become market competitive, especially when biorefining is integrated into the existing chemical, material and power industries.
6. Finland is a small country and culture in the global context. There will be difficulties in maintaining Finnish culture and heritage on the cultural map of the world.
7. Before the year 2015, societies and nations will become networked societies and nations. The network society model is a critical aspect of reality.
8. There is a strong need to develop engineering and natural science competences in the future.
9. The majority of people will do project and flexible work in the future.

These nine critical findings are now a part of the national science and technology policies in Finland. The implementation phase of Finnsight 2015 has begun. Tekes and the Academy of Finland are active in this phase of implementation.

2.6. The Education Intelligence Foresight System (The Confederation of Finnish Industries)

Education Intelligence is a long-term forward-looking anticipation project organised by the Confederation of Finnish Industries EK. It seeks to anticipate changes in the operating environment of industrial and construction-based clusters and the impact of such changes on competence and training needs in the year 2015. The clusters, which were analyzed, were (1) the ICT cluster, (2) the well-being cluster, (3) the chemistry and biotechnology cluster, (4) the forestry cluster, (5) the construction, real estate and infrastructure cluster and (6) the Service and Knowledge Intensive Products (SKIP) cluster. A cluster is understood as a pool of suppliers, producers, customers and competitors, which promotes efficiency, increases specialisation and provides a competitive advantage. A cluster is a network of networks in which competition and cooperation co-exist.

Education Intelligence was implemented side by side with another important anticipatory project of the Confederation of Finnish Industries (EK) called Services 2020, which focuses on the private service sectors. The Education Intelligence project used many foresight methods and planning tools such as networking, seminars, workshops, study visits, Delphi surveys, interviews, web pages and virtual work space (see figure 3).

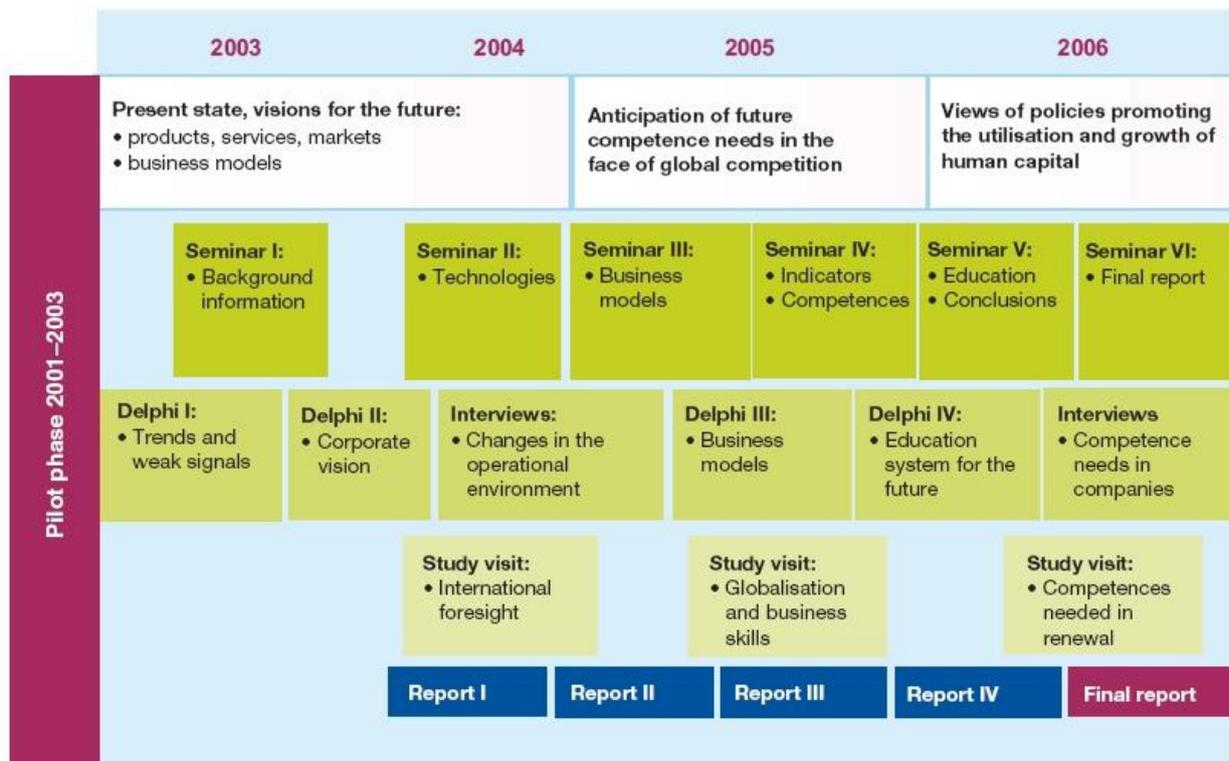


Figure 3. Education intelligence process (Confederation of Finnish Industries 2006, 11)

The Education Intelligence Project also seeks to provide a vision of the future business environment, products and services, the labour market and the competences required by companies operating in six industrial and construction sectors in the year 2015. The pilot phase of Education Intelligence was carried out from 2001 to 2003, which was followed by a three-year follow-up project launched in August 2003. The second phase was implemented from 2004 to 2006. According to the Education Intelligence project the change drivers of Finnish educational system are the following (see figure 4).

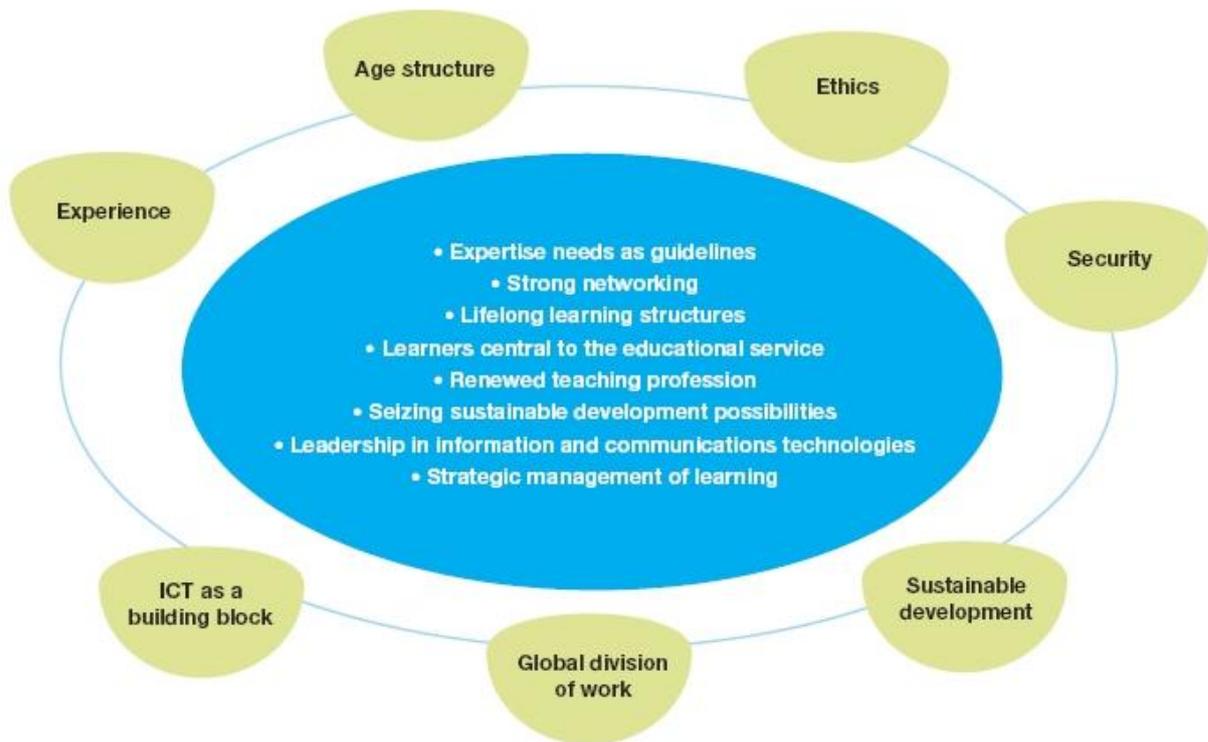


Figure 4. Change drivers and educational systems (Confederation of Finnish Industries 2006, 5)

The Education Intelligence project also identified key competences contributing to corporate competitiveness. They are presented in figures 4 and 5.

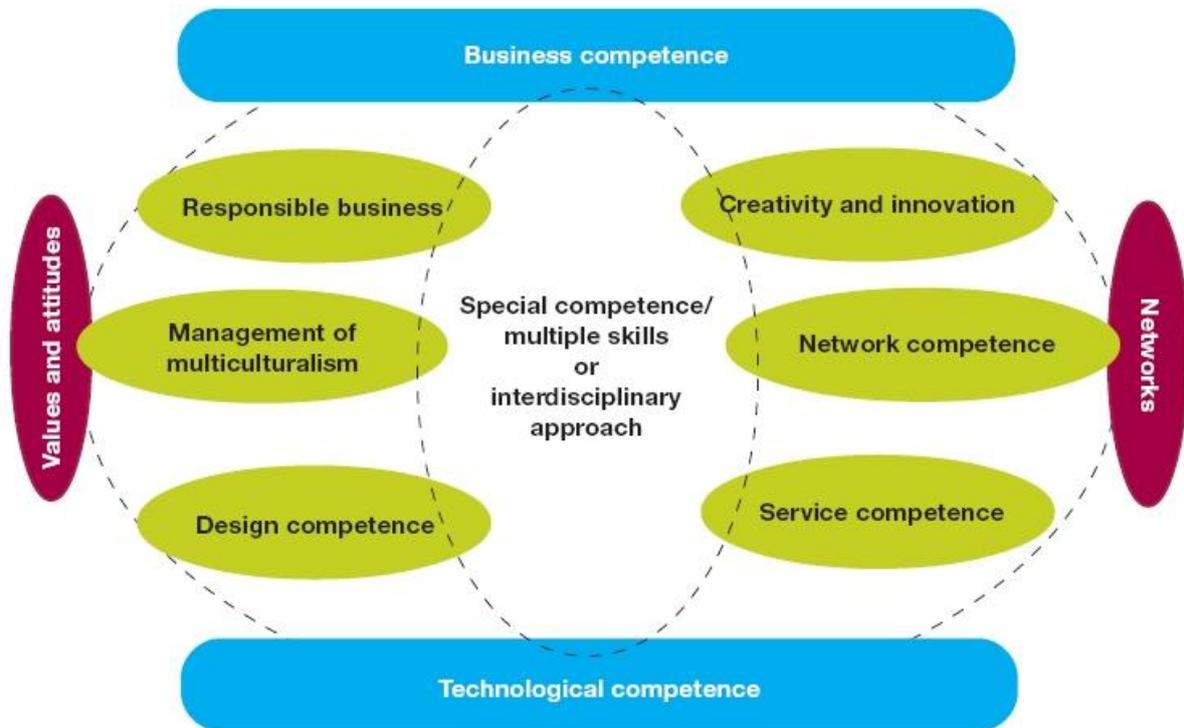


Figure 5. Competences contributing to corporate competitiveness (Confederation of Finnish Industries 2006, 5)

The Organisational and business model of the business life: This is an innovative, competent and learning network that is able to anticipate the needs of the customer in an interactive relationship. By making use of conventional and new processes the network is capable of offering ethical and competitive solutions and creating value in a global operating environment. (The Confederation of Finnish Industries 2006, 22)

Successful company: This is an international company that is competent, confident inspiring, bold and the best responsible growth company in its line of business, or a strategic partner of such a company. It is also a network-builder that attracts experts with multiple skills and supports their further development. (Confederation of Finnish Industries 2006, 23)

The employee of 2015: This is seen as a change-maker who values their ability and that of others and is committed to developing and sharing skills and competence. (Confederation of Finnish Industries 2006, 23)

Labour market of the future: This is regarded as a multifaceted labour market where a spearhead group of companies, working side by side with more traditional organizations, continually develops new, more competitive organisations and tasks. Both the job-seeker and the employer will be in a position to select the most suitable option from the local and global opportunities. (Confederation of Finnish Industries 2006, 24)

According to the Education Intelligence project, in 2015, the approach to business will be customer oriented with companies providing innovative, value added services in response to a customer's future and

acute needs. Often, the solutions will be worked out in collaboration with the customer. For the customer, value may mean aesthetically pleasing or ergonomic design, a non-scratch coating, the ability to recycle products, or a sound service concept. In this process, technology is usually the facilitator, sometimes even the core of the innovation. The corporate organisational model will consist of an amoebae-like collaborative network that renews itself continually. Work will be carried out in global and virtual teams engaged in genuine cooperation, even if the members of a team may be geographically far apart from one another. In a complex and fast-changing world, success is based on having the sensitivity to understand and interpret current views and prospects for future development. Responses to changes in operating conditions will have to be quick and flexible and efforts will have to be made to prepare for unforeseen developments as well. As far as employees are concerned, there will be calls for high standards of competence, excellent international interpersonal skills and boldness in examining issues from fresh angles. (Confederation of Finnish Industries 2006, 22)

2.7. ETLA Economic 5-year Regional Forecasting System (The Research Institute of the Finnish Economy)

The Research Institute of the Finnish Economy has developed a sophisticated nationwide regional model, which is linked to the global economy. This model produces five year projections for regional GDP for both production and employment in 30 industries on a twice yearly basis. The model also makes forecasts on unemployment, population and migration in all the 17 counties of Finland.

ETLA's forecasting unit monitors and forecasts economic developments and reports them in various publications appraises the impact of economic policy actions and develops the necessary analytical tools needed for those tasks. The main publication of ETLA's forecasting unit is *Suhdanne (Cycle)*. An English Summary of the Finnish Economic outlook is released on the Internet when *Suhdanne* is published. In addition, the ETLA forecasting group regularly prepares various types of special reports. ETLA distributes the World Commodity Prices report compiled by the association of European economics research institutes, AIECE. ETLA also participates in the preparation of the report. (ETLA 2007a)

ETLA publishes regularly forecasting reports. An example of these reports is the new short forecasting report "Main Features of Finnish Economy 2007–2008", which gave the following anticipatory global economic results in June 2007 (ETLA 2007b):

1. Asia continues to boost the pace of the world economy.
2. China's contribution alone to world economic growth is close to 1.5 percentage points. The U.S. economy is in the middle of a soft landing, which was caused by a sharp fall in housing sector investment. Straightening the large household sector financial deficit will require more household saving and a slow down in private consumption.

3. The Euro Zone aggregate output economy will expand by roughly 2.5 % a year. The ECB will continue to raise its main interest rate to at least 4 %.
4. Economic growth in Finland will slow to 2.7 % this year and be 2.8 % in 2008.
5. Exports will expand by 4.5 % in 2007 and by 6 % in 2008.
6. Fixed investment will accelerate next year with the acquisition of the Olkiluoto nuclear reactor and other equipment for the new nuclear power plant and Finnair's purchases of aircraft. Rising interest rates and housing prices will shift the emphasis in construction from residences to business related construction.
7. Private consumption will increase at a slower pace than during the past few years as fewer jobs will be created. Inflation will also rise slightly.
8. Public sector financial surplus contracts will continue as normal. There will be no room for permanent additions to public consumption expenditure.
9. Aging and globalisation will continue to be the biggest challenges faced by the Finnish economy.
10. Risks will increase as the prolonged strong world economic growth continues. An unexpectedly abrupt deceleration of the U.S. economy remains the greatest risk.

The ETLA forecasting system focuses on basic economic indicators and analyses. It provides comprehensive analyses for decision-makers in the Finnish economy.

The ETLA forecasting system also produces important trend information. An example is the current production trends in OECD countries and Finland shown below in figure 6.

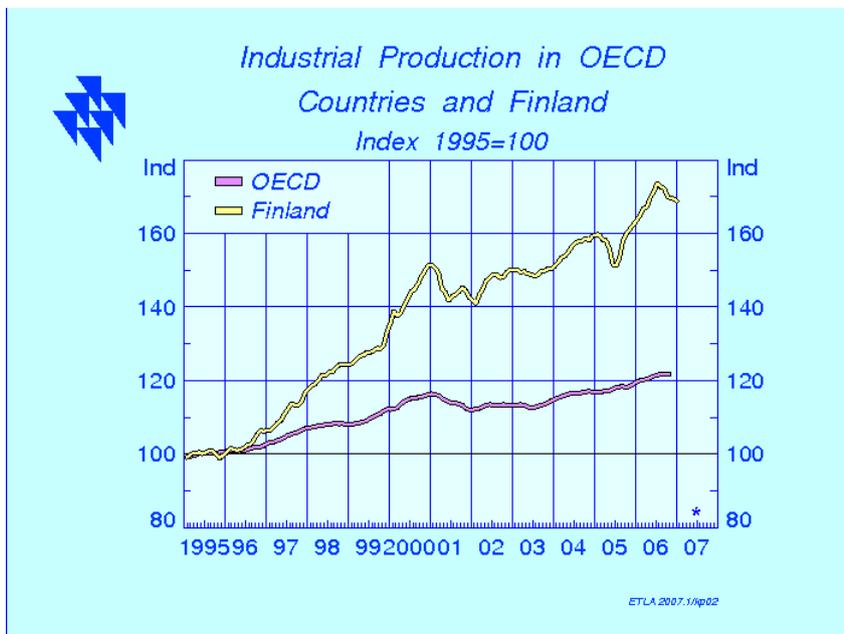


Figure 6. Production trends in OECD countries and Finland (ETLA 2007c)

This kind of trend information is, of course, useful for industrial and business decision-makers in Finland.

2.8. Tekes foresight systems and technology policy activities (The National Technology Agency, Tekes)

Tekes, the National Technology Agency was founded in the year 1983 as an independent agency under the auspices of the Ministry of Trade and Industry. Until the end of 1980's the main development areas of technology were determined by the representative committees of the development of the technology programme initiatives. Systematic analyses of the technology trends and the future needs of knowledge and know-how in technology began in the late 1980's as an internal exercise within Tekes. VTT was also active in this field in 1980s. These technology foresight analyses have been continued as normal practice since then. (See e.g. Ranta 1993, Hernesniemi, Lammi & Ylä-Anttila 1996, Ruokanen & Nurmio 1996, Tekes 1997)

The key focus of Tekes is technology foresight and its impact on technology and innovation policy in Finland. Tekes is a key institution of the Finnish innovation policy. It is responsible for Finnish technology strategy and technology programmes. Tekes also performs technology foresight for innovations within industrial clusters and focuses on interesting project cases.

Finland continuously develops its research and innovation environment, in which foresight work is seen as a significant tool for aiding decision-making. The National Technology Agency, Tekes is one of the most important actors in the field of foresight in Finland. From the beginning of 2008 Tekes has, under the MEE, based all its operations on its mission, vision and values. The strategy that Tekes follows consists of the objectives, core activities, policies and actions with which Tekes implements its mission and pursues its vision.



Figure 7. Tekes: Mission, vision and values (Tekes, www.tekes.fi)

Mission statement. Tekes aims to boost the development of Finnish industry and the service sector by technological means and through innovation. This activity seeks to renew the economy and increase added-value, productivity and exports, thereby creating employment and enhancing well-being. (Tekes, www.tekes.fi)

Focus areas. The focus areas outline future priorities for innovation in Finland. Tekes intends to encourage innovation in areas defined on the basis of clear user need in fields such as products and business models, the environment and energy, health and well-being, services, safety and security, and work and leisure. (Tekes, www.tekes.fi)

Strategic lines. Tekes will renew its strategic guidelines in foresight every third year. The most important and crucial vision statement is that on cooperation between the sciences, enterprises and the public sector. An increasingly important principle is that citizens and stakeholders are involved in foresight processes. (Tekes, www.tekes.fi)

Recently there have been very critical reviews of technology foresight experiences in Finland. Critics have focused on the following issues (Pulkkinen 2000):

- (1) International technology foresight studies tend to be a too linear continuation of the past. No consequential taking-offs could be found from them.
- (2) The progress of the national technology foresight exercise was the second biggest disappointment for Tekes foresight research. Again the future seemed to be a linear continuation of the past. The major findings were very familiar: the applications of information technology will be increasingly important, the information society will be strengthened and deepened, the economy will become ever more global and international, competition will be tightened, the importance of knowledge will increase, networking will become ever more important, the need for flexibility and ability to react rapidly will have to be enhanced. The results of the national foresight exercise were seen as too self-evident. Maybe that was also reason why the public discussions didn't raise any radical insights into future developments.
- (3) The proposals for future action were the third disappointment. All the proposals were very familiar: e.g. the education and training of employees and the strengthening of research groups in manufacturing. All proposed topics for future research and development projects were identified already before the foresight exercise. These were: rapid methods for product development, smart products, user interface, product data management, flexible assembly, management tools and methods for manufacturing business in networks, methods for distributed manufacturing, the factory of the future, routes for lean and flexible materials production, materials utilisation and logistics.
- (4) The limited discussion, which the foresight exercise awoke, was perhaps the poorest of all the results. During the exercise it became evident that the process itself was the most important effect, not its results. It was also claimed that such a process could be extremely important,

especially if a large amount of people were concurrently active in discovering and combining the effects of technology, new business possibilities, important RTD topics etc.

These critical aspects are important to keep in mind when work life foresight activities are planned. There should be more room for non-linear complexity thinking and public participation and discussion when foresight programmes are implemented. An interesting R&D project in this field has been performed by the Technical University of Lappeenranta, which has tried to incorporate futures research into regional knowledge creation and management (see Uotila 2008).

2.9. VTT's foresight systems

As defined in VTT's Internet pages (www.vtt.fi), it is the biggest contract research organization in Northern Europe. VTT provides high-end technology solutions and innovation services. From its wide knowledge base, VTT can combine different technologies, create new innovations and provide a substantial range of world class technologies and applied research services, which improve its clients' competitiveness and competence. Through its international scientific and technology network, VTT can produce information, upgrade technology knowledge, create business intelligence and provide a value added service to its stakeholders. VTT is a non-profit-making research organisation and is part of the Finnish innovation system under the domain of the Ministry of Employment and the Economy. Within VTT there are about 2780 persons working in different fields of technology.

The VTT vision is: VTT produces research services that enhance the international competitiveness of companies, society and other customers at all stages of their innovation process. VTT thereby creates the prerequisites for growth, employment and well-being. VTT promotes the realization of innovative solutions and new businesses by foreseeing at the strategic research stage the future needs of its customers. VTT creatively combines its multidisciplinary expertise with the know-how of its partners. VTT also exploits global networking and the basic research results of universities in its services.

VTT foresight activities focus on technology foresight and technology policy evaluations. VTT is a large technology research and development organization, which is key part of the Finnish innovation system. Within this VTT's foresight activities are connected to innovation policy topics. In recent years it has carried out various important foresight projects. Furthermore, its activities have been connected to the Nordic Foresight Forum, where VTT has been an active partner. Key projects in its Nordic co-operation have been (1) Foresight Biomedical Sensors, (2) Nordic ICT Foresight and (3) Hydrogen Foresight Project. A special research interest field in the field of foresight has been technology road-mapping studies. VTT has made various technology roadmaps for different technology areas. VTT has also produced sectoral/cluster technology foresight studies, research on foresight activities and methodologies, and been involved in international TF cooperation at Nordic and European level.

A very good example of Nordic co-operation in the foresight field is the Nordic ICT Foresight project where VTT was a key partner in the promotion of Nordic foresight cooperation. The Nordic ICT Foresight project was launched in May 2005 with the research partners VTT Technical Research Centre of Finland, FOI (Sweden), SINTEF (Norway) and DTI (Denmark). The aim of the project was to contribute to the strategic intelligence of the Nordic knowledge region so that the full potential of information and communication technology could be exploited to increase welfare in the Nordic countries. The focal areas of the ICT applications in this study were the experience economy, health, the production economy and security. In the research process there were five research phases: 1) a desktop survey, 2) SWOT analysis, 3) a scenario and vision workshop, 4) a road-mapping workshop and 5) an action workshop. Methodologically the project was a very good demonstration of the skilful use of the hybrid methodology of foresight research. A typical approach in current foresight projects is to combine quantitative and qualitative methodological approaches. Some experts call this approach "the numbers and narratives" approach. Some policy recommendations were formulated on the basis of the Nordic research process. The policy recommendations were divided into implementation strategies, i.e. actions that should be proactively pushed through on the Nordic level, and adaptive strategies, i.e. actions that are more reactive in the face of global developments. The implementation strategies were (1) the creation of Nordic SME-based competence clusters and/or platforms in converging technological niches, (2) enhancing the utilisation of mobile ICT infrastructures for remote monitoring, (3) an initiative for the creation and integration of Nordic test markets for ICT applications and ICT policies in the health sector, (4) a Nordic level research and policy initiative to develop new ICT-based concepts for information and general security, (5) the ideation and creation of new business models for the user-driven application developments, and (6) a Nordic initiative to enhance electronic business transactions and applications. The formulated adaptive strategies were (1) moving towards a deeper understanding of the cultural contexts of new services and solutions, (2) learning to utilise and productize innovations in the second or third wave, (3) widening the scope of innovation and learning to "recycle" the ideas into new niches, and (4) creating strategies for the utilisation of a "long tail" in the Nordic sphere. (Ahlqvist, Carlsen, Iversen & Kristiansen 2007)

In recent foresight evaluation some new interesting aspects are presented from VTT foresight research. According to the report by Ahlqvist, Uotila and Harmaakorpi (2007), foresight can have a significant role in supporting innovation activities and breaking for example path-dependence tendencies connected to regional development trajectories. However, according to many recent studies one major challenge facing foresight activities is that the results of those activities are not fully utilised in regional decision making and national policies. Ahlqvist et al (2007) underline the importance of good foresight research practices that help the information produced during foresight process to be "re-rooted" back into regional innovation system in order to support the innovation processes carried out in the region. This kind of "re-rooting" should be taken seriously also in foresight studies connected to work life and work life practices. Efficient knowledge management and knowledge sharing are key challenges in foresight research today. European countries are facing this common challenge in many contexts, also in the dynamic field of work life research.

2.10. SITRA's foresight systems

Sitra, the Finnish Innovation Fund, was set up in conjunction with the Bank of Finland in 1967 in honour of the 50th anniversary of Finnish independence (www.sitra.fi). The fund was transferred to the Finnish Parliament in 1991. Sitra is an independent public fund which under the supervision of the Finnish Parliament promotes the welfare of Finnish society. Sitra's responsibilities have been stipulated in law. Since its establishment, Sitra's duty has been to promote stable and balanced development in Finland, the qualitative and quantitative growth of its economy and its international competitiveness and co-operation. It describes itself in the following way. "Our operations are governed by a vision of a successful and skilled Finland. We have always approached our operations with strong belief in the future and in the ability of the latest technology to generate well-being. Sitra's operations have been focused into fixed-period programmes, each of which consists of various projects and measures. "

In addition, two new programs, the Energy Program and the Program for the development of a network-based operating model, were begun at the beginning of 2008. The programs utilise a wide array of methods, including studies, strategy processes, innovative experiments, business development and corporate funding. The methods used vary from programme to programme.

Sitra's programme-based operations made an excellent start. In 2006, they focused on selected programme areas concerning; innovations, health care, food and nutrition, environment, Russia, and India. Collaboration with partners brought excellent results and best practices were promoted. The spearhead projects within the programmes created new operating models. For example, the Health Care Programme promoted electronic health care services, while the Food and Nutrition Programme issued a strategy in May that steers Finland towards becoming a pioneer in healthy nutrition. The Environmental Programme focused on strengthening the Cleantech industry aimed at boosting Finnish environmental business. The Russia Programme worked on the industrial park project to help the expansion of Finnish enterprises in the Russian market. The Innovation Programme launched the National Foresight Network, and the India Programme produced new insights into the opportunities offered by India.

Sitra's foresight topics are the following (See SITRA 2008 www.sitra.fi/en/Programmes/CompletedProgrammes/innovation/foresight/topics/topics.htm):

Future of welfare and everyday living

People's everyday life and factors affecting their well-being are in a state of transition. The transition has to do with people's needs, values and attitudes, lifestyles, everyday roles, resources and the changing operating environment. The topic for this thematic group is the well-being of individuals and families and everyday life in the future.

The future of work life

The nature of work life is also in transition. The future of work life is shaped by, for example, increasing knowledge intensity, mobility, pressure, fragmentation and uncertainty of careers, internationalization

and networking. The relationship between work and other aspects of life is changing. This also applies to competence demands in work life and sets new challenges for the functioning of labour markets and the education system. The transition in work life is significant both for the well-being of employees and for the success of enterprises.

The future of the public sector

As a result of the two prior industrial revolutions, the social role and tasks of the public sector changed considerably. It is expected that this will also follow the current transition. The traditional hierarchical welfare state is no longer economically and organizationally tenable. The change in the tasks of the public sector will also affect its organizational model. A hierarchical and sector-based administrative model no longer meets the demands of complex and wide-ranging political challenges typical in times of transition.

Multiculturalism

Finnish culture is exceptionally homogenous. Immigrants count for a very small portion of our population. However, this situation will not continue. Owing to globalisation and the ageing workforce, immigration and multiculturalism will increase also in Finland. The Finnish society is not sufficiently prepared for this. Increasing immigration and multiculturalism will affect the Finnish society. As a result, Finnish everyday life, business life and activities of the public sector will change.

The future of environmental technology

The foresight project of the Environmental Programme aims at utilising the rapidly changing and growing environmental technology markets. Concern for the state of the environment increases the pressure to make changes in environmental policies and to tighten legislation. At the same time, it creates possibilities for innovations and the growth of the environmental business sector. Due to the rapid development of and changes in the markets, the foresight project is challenging and important to the sector. The foresight work in the subject area is also part of Sitra's Environmental Programme.

To sum up, Sitra has recently been a very active player in national foresight activities, especially in the National Foresight Network. The first wave activities of the National Foresight Network in 2006 culminated in the TulevaisuusFoorumi – Future Forum held in Nokia. The Finnish-language final report of the National Foresight Network, Kohti hyvinvoivaa ja innovatiivista yhteiskuntaa (Towards an innovative welfare society), was introduced at the event. (Hämäläinen 2006)

The National Foresight Network activities for future years have been planned now and one key challenge will be an Internet forum for Finnish foresight activities: www.foresight.fi (to be published during December 2008).

3. REGIONAL FORESIGHT SYSTEM IN FINLAND

3.1. Foresight activities and methods at regional level

The Ministry of Labour started a foresight project for Employment and Economic Development Centres (TE Centres) in 1998. During the project a vision of regional foresight activities and methods in Finland in the year 2010 was developed ⁸. The methods and activities can be classified into quantitative and qualitative both long term, medium term and short term methods. (See Kaivo-oja, Marttinen and Varelius 2002, Marttinen 2003)

Table 4. *Time spans and foresight methods in ministerial foresight activities*

Time span	Quantitative methods	Qualitative methods
Long term (6-20 years)	Long term (LT) model, MITENNA model	Scenarios, Delphi, megatrend analysis weak signal analysis, future-workshops etc...
Middle term (3-5 years)	Regional econometric model (ETLA)	Cluster analyses
Short term (½-2 years)	Interviews with enterprises Barometers	Expert panels (SWOT/Delphi))

There are four characteristics that distinguish foresight from other kinds of future studies. Foresight research is always an action-oriented enterprise. Foresight does not only mean analysing or contemplating future developments but includes supporting actors to actively shape the future. Therefore, foresight activities should only be undertaken when it will be possible to use the results to influence the future. (FOREN GUIDE, Toivonen & Nieminen 2003, FOR LEARN 2007)

Foresight is always open to alternative futures. In foresight activities stakeholders assume that the future is not pre-determined. The future can therefore evolve in different directions, which can be shaped to some extent by the actions of various players and the decisions taken today. In other words, there is a certain degree of freedom to choose from among the alternative, feasible futures discovered and hence increase the chance of arriving at a preferred (selected) future state. (FOR LEARN 2007)

Foresight is participatory. Foresight is not carried out by a small closed panel of experts or academic scholars but involves a number of different groups of actors concerned with the issues at stake. The re-

⁸ Jouni Marttinen, Integrating Foresight in the TE Centres activities, A Vision for 2010 and a Development Strategy, Ministry of Trade and Industry, Ad hoc committee reports 1/2003. Helsinki.

sults of a foresight research exercise are disseminated among a large audience from which feedback is actively sought. (FOR LEARN 2007)

Foresight is a multidisciplinary research enterprise. Foresight is based on the principle that the problems we face cannot be correctly understood if reduced to one dimension and sliced up to allow them to fit into the perspective of the different academic disciplines. Instead, foresight research provides an approach that captures realities in their totality with all the variables influencing them, regardless of type (quantitative and qualitative). (FOR LEARN 2007)

These basic principles of foresight research are nowadays quite well known, but in practical foresight projects these principles are not fully followed by foresight practitioners and stakeholders. It is obvious that various international and national agencies still understand the concept of foresight in various ways. (for more about regional foresight methodologies see Kaivo-oja, Marttinen & Varelius 2002, Marttinen 2003)

In Finland there are many alternative barometer systems. The most important are the PK-SME Economic Cycles Barometer (Federation of the Finnish Industries), Technology Barometer (TEKBARO), Enterprise Barometer (Finnish Entrepreneurs and Finnvera ⁹), Regional Barometer (Statistics Finland), Social Barometer (The Finnish Federation for Social Welfare and Health), Youth Barometer (Statistics Finland) etc.

3.2. Current strategically important regional foresight activities

In 1998 The Ministry of Labour launched a national foresight project within the Employment and Economic Centres (TE Centres) in Finland. The goals of the national foresight project in Finland were (see e.g. Marttinen 2003):

- § To support the TE Centres in developing a regional foresight system for every TE Centre in Finland
- § To launch foresight activities in TE Centres,
- § To integrate foresight into strategic planning, management systems and other core processes,
- § To train experts in foresight and
- § To connect the results of regional foresight into the national labour market- and economic development- policy.

In the beginning all the TE Centres drew up a launch plan for their foresight project. The goals of the launch plan were to describe the vision of the foresight system of the TE Centre; what kind of future da-

⁹ Finnvera is specialised in financing companies offering financing services to promote the domestic operations of companies.

ta, information and knowledge are needed in the core processes, which foresight methods and activities are used, how can the co-operation and networking of regional and local actors be managed, how can the data and knowledge be managed and what is the role of the TE Centre in the regional and local foresight system. (Marttinen 2003)

An example of the goals in developing a regional foresight system comes from the TE Centre for Southwest Finland. It aims:

- § to create a permanent research and foresight service for The TE Centre for SW Finland, its partners and key customers,
- § to focus on labour market and economic changes by collecting, re-producing and delivering information for local planning and decision making processes,
- § to create new understanding and information tools for the labour market and business environment changes in short and medium time spans by interpreting the most essential changes in business volumes, expectations, qualification needs and emerging issues,
- § to foster sub-regional foresight processes by information and methodological aid and
- § to create an easy access www-site by which the most urgent anticipation needs can be fulfilled regionally (NUTS 3) and sub regionally (NUTS 4).

During the foresight project in SW Finland a joint regional foresight unit of the Regional Council and the TE Centre has been established. This unit serves both organisations and their customers by producing and openly disseminating data, information and knowledge concerning the future development of Southwest Finland and its sub-regions. The project has also developed databases and an Internet service (www.luotain.fi) where the results of foresight activities and processes can be found. (Marttinen 2003)

In Finland all the regions implement and utilise long term, medium term and short term foresight activities, both quantitative and qualitative. The aim of the core short time foresight process is to interview enterprises (the TKTT model) and to arrange expert panels. The Research Institute of the Finnish Economy produces medium term regional forecasts (5 years) for production and employment by industry. The Ministry of Labour and The Finnish National Board of Education produce long-term regional forecasts for the relevant industry and occupation. (Marttinen 2003)

3.3. The study of the need for workforce and training (the TKTT model)

The need for workforce and training needs for enterprises has been studied in Finland since 1989. Civil servants in employment offices interview firms and ask for their short-term views on various subjects. The themes of the interviews are (Marttinen 2003, Marttinen 2007):

- § Changes in the use of their workforce – increases/decreases by profession (3 classification levels)
- § Recruiting problems (3 classification levels)
- § Training requirements for professions and job assignments (3 classification levels)
- § Changes in core professions and job content (3 classification levels)
- § Age distribution and the retirement rate of personnel
- § The economic situation now and in one year
- § Training needs and presentations of those needs to educational institutions
- § Networking and sub-contracting needs and new business ideas
- § Prospects for export contracts
- § Investment needs
- § Needs for premises
- § Open comments

The main eleven step type phases of the TKTT foresight model are: (1) The selection of fields of business, (2) Training for interviewers, (3) Launching the campaign, (4) Carrying out the interviews, (5) Applications, (6) Producing a summary for a council of experts, (7) Meeting the council of experts and a SWOT analysis, (8) A Delphi survey, (9) Reporting, (10) Phase II applications and finally (11) A gauges phase. This highly interactive TKTT foresight model has been found to be very useful in South-West Finland, which is why its main characteristics have been reported here. (Marttinen 2007)

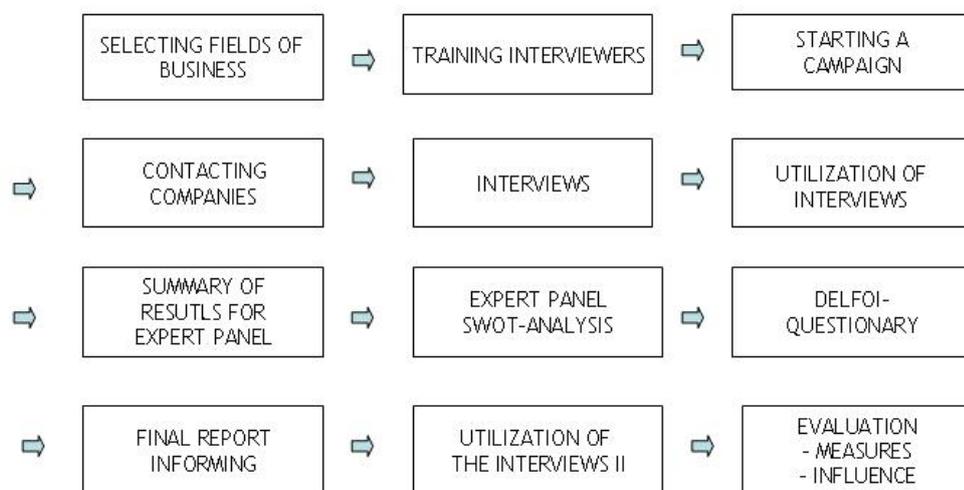


Figure 8. The TKTT process in Southwest Finland.

Phase I The selection of fields of business

Decisions concerning the selection of fields of business are made chiefly in the result-based management process between employment offices and the labour department of the TE Centre. Employment offices make a proposal concerning the fields of business to be interviewed and the number of businesses to be interviewed. In its result based management, the TE Centre/Labour department can recommend certain business fields for interview. (Marttinen 2007)

When a TE centre/employment office makes proposals concerning the fields of business the criteria for selection are as follows (Marttinen 2007):

- § The employment office is not very familiar with the field of business, its core professions, training and skill requirements, etc.
- § There is a desire to improve the market share of the employment service in the business field in question.
- § The field of business is a so-called "growth field", in other words, according to the office's knowledge, it is difficult to obtain skilled labourers for the field.
- § The field is a field where structural changes take place often and/or it is rapidly changing.
- § The field is an area of focus in the province.

Phase II Training for the interviewers

Prior to beginning the interviews, the TE centre shall organize a training course for employment office representatives (i.e. campaign managers and other interviewers). During the training, the themes of the interview shall be jointly agreed upon and participants shall be guided through interviews. Participants in the training concerning the business field shall be provided with information about the structure, development and future prospects of the field as background information. During the course, lists of the most important businesses in the field shall be handed out. The ASKO system ¹⁰ may be used to make specialised searches in the Business Information System (BIS) based on a certain business field and district. These procedures are a means to ensure that interviews are directed at the top businesses in the field. In this way, the sample size of the interviews is assured of being large enough. Business field managers shall participate in training for their own field of business. (Marttinen 2007)

Phase III Launching the campaign

The management of the employment office/department chooses a TKTT director and campaign manager in the employment office. A campaign manager may also be chosen at the TE centre.

¹⁰ The CRM (Customer Relationship Management) of the TE-Centres

Employer services clerks and/or applicant services clerks, training unit clerks, international unit clerks and so on shall be chosen as interviewers. Civil servants from the TE centres may also take part in carrying out interviews.

A campaign manager is also chosen for the employment office. This person follows the progress of interviews on the Asko system, contacts businesses and oversees the implementation of the interviews. The campaign manager hands out lists to the interviewers.

The campaign manager and possible TE centre campaign manager follow the progress of contacts and interviews. (Marttinen 2007)

Phase IV Carrying out the interviews

This phase IV has the following elements:

Contacting the company

- § Agreeing on a time for the interview
- § Marketing the TKTT interview, producing marketing material

Other possibilities for acquiring TKTT information (needs for development):

- § Contact by phone – interview form or a summary of it can be delivered in advance before the interview
- § Web survey
- § Use of a laptop
- § Making contact via email

Entering interview results in the ASKO and URA ¹¹ systems (Marttinen 2007).

Phase V Applications

The different phases of application are (Marttinen 2007):

- 1) A business' acute needs immediately after an interview and the response to them;
- 2) The gradual application of the ASKO database during the campaign, for example, advanced information about proposals for training;
- 3) Application at the end of the campaign and
- 4) Application after council.

It is the responsibility of the TKTT interviewer to pass on the acute needs of the companies to the employment office. The interviewer shall also convey an assignment (initiative) to the TE centre's campaign

¹¹ CRM of the Employment offices.

manager and/or to the person who is in charge of the matter in question at the TE centre or employment office. The results of the interviews at the TE centre shall be monitored by either a business field team leader or another officer appointed by the employment department. It shall also be this person's duty to see that there is a response to the companies' acute needs. (Marttinen 2007)

The campaign manager also monitors confirmed messages concerning, for example, needs for training that can be addressed quickly and taken into consideration when planning a training programme or entered into a database which can then be supplemented during the campaign. (Marttinen 2007)

A procedure can be developed for the Asko system, whereby the initiatives may be conveyed automatically to the campaign manager, business field leader and/or person who is in charge of a certain issue. The reporting director drafts summaries of the interview answers from each company. These reports are delivered to those employment offices where the interviews took place, to the primary TE centre units and to the business service locations. A final TKTT report is delivered to the businesses and authors that were interviewed, the members of the council of experts, employment offices, TE-centre departments and sub-regional business services. (Marttinen 2007)

Phase VI Summary for the council of experts

Once the results from the interviews have been completed, they are outlined in a summary to be delivered to the council of experts. The TE service's manager for the business field in question or another TE-centre functionary is responsible for drafting the summary. The possibility for handing over the task of drafting the TKTT summary reports to an external source is then determined. (Marttinen 2007)

At this stage, the report is delivered to the employment office, which has organised a council of experts. The report can still be further edited at the employment office. Reports can be sent either from the employment office or from the TE centre to council members. (Marttinen 2007)

Phase VII The meeting of the council of experts and the SWOT analysis

The organiser of the council is agreed upon at the result-based management meetings or in separate meetings. The employment office/TE centre selects representatives for the council from top companies in the industry, educational institutions, the TE centre business field team, a municipality's development centres, projects and so on. The organisation (usually the employment office or a TE centre unit), to which the task has been assigned, calls the council to a meeting and makes the necessary arrangements for it. (Marttinen 2007)

The council is organised within a month from the deadline for the interviews. The goal is to hold spring interviews before the summer vacation and autumn interviews before the new year. The author of the summary report drafts the council's agenda of the themes, which arose in the answers to the interviews. If necessary, councils may be set up in all employment offices which have conducted a large quantity of interviews in the field in question. (Marttinen 2007)

Phase VIII The Delphi survey

The results of the expert panel are studied by means of Delphi questionnaires. The Delphi survey is then sent back to the panel and to the enterprises, which have been interviewed. (Marttinen 2007)

Phase IX Reporting

A final report is sent from either the employment office or the TE centre to the businesses interviewed and to the members of the councils of experts. Likewise, the report is delivered to TE centres, government ministries, the development centres of provincial sub-regions, educational institutions, etc. Information concerning essential results shall be sent to the media. If necessary, a briefing on the interview results can be arranged. The report is published on the Internet on the regional (and national) webpage. (Marttinen 2007)

Phase X Applications II

After the convening of the councils of experts, the results of the interviews and the council's SWOT analysis are presented to the following arenas/forums (Marttinen 2007):

- § TE centre staff;
- § TE centre departments;
- § TE centre/ the Employment and Economic Development Centre/labour department's management group;
- § TE centre units, especially the workforce training unit;
- § Forecasting and acquisition committee;
- § MYR's training department;
- § Business service locations;
- § The TE centre business field team;
- § Forecasting and acquisition committee of the TE Centre;
- § Directors of the employment offices;
- § The heads of workforce training, employer services, employment services and
- § Employment offices' morning meetings.

TKTT interview results can be applied (Marttinen 2007):

At employment offices:

- § in planning and obtaining local workforce training;
- § in identifying problem businesses;
- § in employment services (companies adding to their workforce and companies where recruiting is problematic);

- § in location guidance and networking activities (sub-contracting needs, externalisation, premises needs);
- § in safeguarding activities during change; and
- § in communications profiling employment offices for image-building.

At the TE centre:

- § in planning and obtaining regional workforce training;
- § in business environment analyses, labour market analyses, in economic and business condition reviews, probe reports etc.;
- § in identifying new business potentials and outlines for innovation (new business ideas, externalization plans, networking and sub-contracting needs);
- § in communications profiling the TE centre;
- § in business field teams (i.e. when considering measures for development); and
- § in implementing strategy i.e. when reducing recruiting difficulties, such as ensuring the availability of labour and in improving regional competitiveness through e.g. skill development

In government ministries:

- § in drafting regional economic reviews; and
- § in drafting business field reports.

In regional developer organisations:

- § in planning training in educational institutions (workforce training projects, training needs, contacting companies); and
- § in planning and developing areas of focus for provinces.

In companies:

- § in positioning a company's status in the area of the company's business field.

The strong aspect of the TKTT foresight system is that it is possible to utilise its results in many organisations and institutions.

XI Gauges

The effectiveness of the interviews can be monitored, for example, by the assignments received during the interview (vacant job positions, training positions, subsidised job positions, apprenticeship positions etc.). These can be monitored in the URA system. The initiative can be monitored in the ASKO system (Marttinen 2007).

Possible gauges for organisational effectiveness can be (Marttinen 2007):

- § The workforce training which has been initiated,
- § The creation of jobs after workforce training,
- § The implementation of the measures proposed by the council of experts,

- § The effectiveness of the workforce training; people unemployed three months after completion of the training,
- § The market share of the employment services,
- § Assignments/initiatives (their percentage compared to visits),
- § HR assignments, and
- § Other spill-over projects.

These above are important for competitiveness, because they provide feedback on strategic thinking processes. Today strategic thinking is a synthesis of intuition and creativity. Strategic thinking is also a marriage of information and insight that allows a clear understanding of how to reorder elements to maximize results within an emerging and often discontinuous context. The TKTT foresight system provides an integrated perspective on working life organisations. (Marttinen 2007)

3.4. Occupation barometer

The employment offices collect large amounts of data, information and knowledge about the local labour market. During a single year over 40 000 vacancies are informed as being open in Southwest Finland. Employment offices discuss daily with companies and job seekers. The market share of the employment offices in Southwest Finland is about 60 %. Thus the employment offices have the best understanding of the requirements and function of a local labour market.

The employment offices in Southwest Finland answered three questions (1) How will labour force demand develop during the next year?, (2) What is the balance between the supply and demand for the labour force? and (3) Is a shortage in a labour force so difficult that the growth of a sector is in danger? The employment offices ask those questions with reference to about 200 occupations. The TE centre in question then classifies these 200 occupations into three categories (a) lack of jobseekers, (b) balance and (c) a surplus of jobseekers.

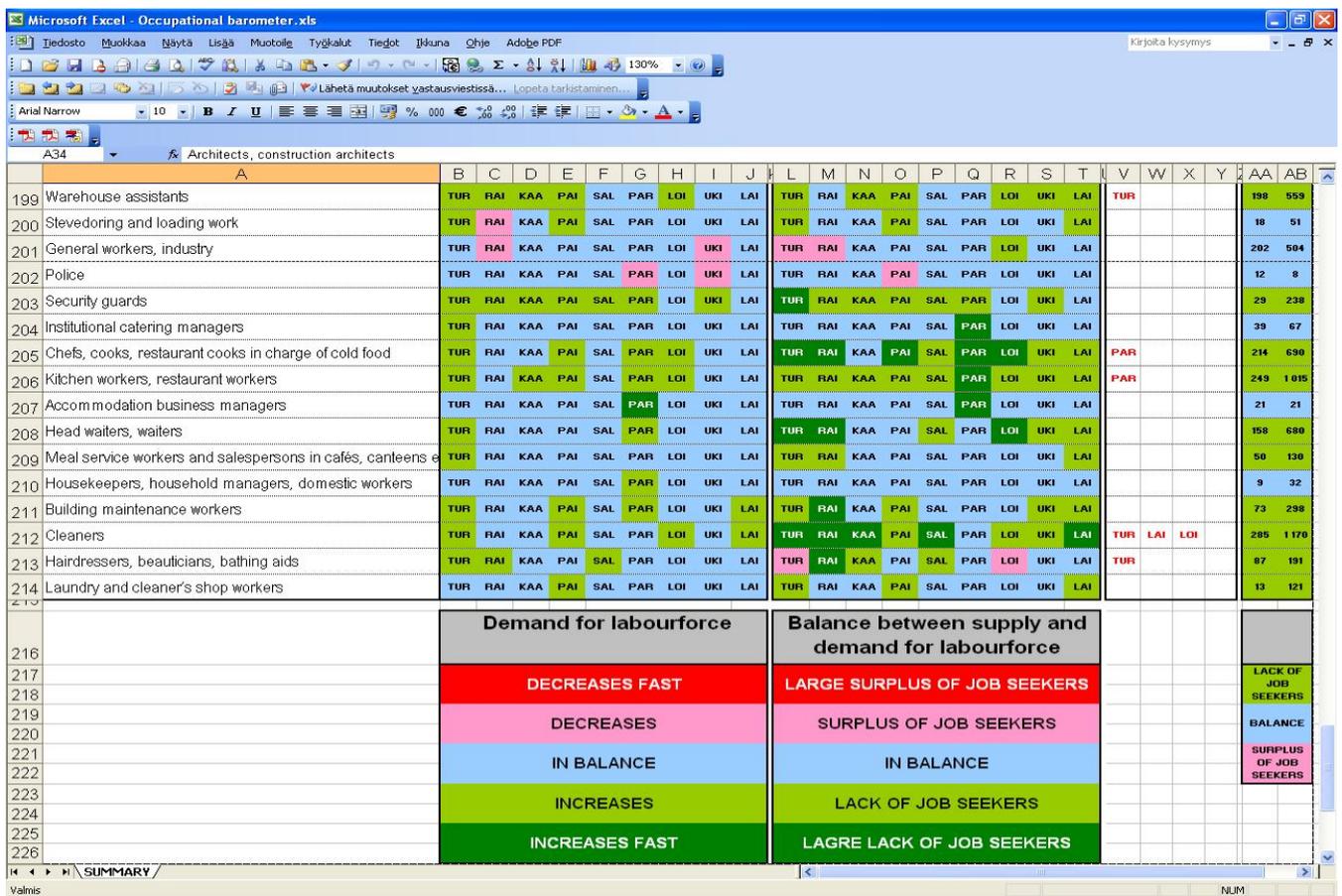


Figure 9. Occupation barometer 2008–2009 in Southwest Finland

Finally the barometer is printed on posters in Finnish, Swedish and English. The occupation barometer is utilised in the employment service, the planning of vocational training, the matching of the demand and supply of the labour force, in the planning of immigration, in the anticipation of the local and regional labour market etc. (Marttinen 2008)

3.5. Regional cluster analyses

One important element of the Finnish foresight system has been regional and national cluster analyses. Common to all cluster approaches, though to a varying degree, has been the view of clusters as geographical agglomerations. This was also a distinctive feature of Porter's definition, which he introduced in his country case studies at end of the 1980s. In Finland Porter's cluster approach has been used since then. Porter's findings and the policy implications, presented in *The Competitive Advantage of Nations* (Porter 1985, 1990), brought the concept and the cluster approach to the forefront, and served as a benchmark for a series of national cluster studies conducted over subsequent years. For Porter, clusters are pri-

marily agglomerations concentrated within national borders. However, by emphasising the importance of geographical proximity, his definition also allows cross-border interpretations (see figure 10).

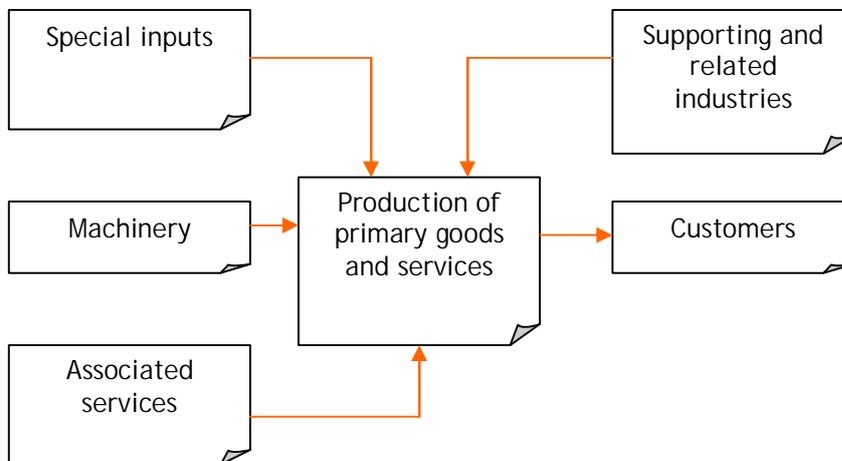


Figure 10. A Porter cluster chart

One very crucial dimension is the mode of interaction between actors in a cluster. Roelandt and den Hertog (1999a) have identified four kinds of linkages in empirical studies:

- § Trade or transaction linkages
- § Innovation linkages
- § Knowledge flow linkages
- § Common knowledge base or common factor conditions

On a more general level, a division can be made between tangible and intangible linkages, that is, transaction and information or innovation linkages, which act as basic determinants in defining clusters. The interpretation of a cluster as an innovation network has its origins in the 1980s, when national innovation systems (NISs) were evolving into a separate theoretical framework for the design of a technology and science policy (Roelandt and den Hertog, 1999b). This new interpretation of clusters is also gaining popularity among scientists and policy-makers in Finland. We can say that in the case of Finland different kinds of cluster studies have an important link between foresight and innovation studies (see figure 11).

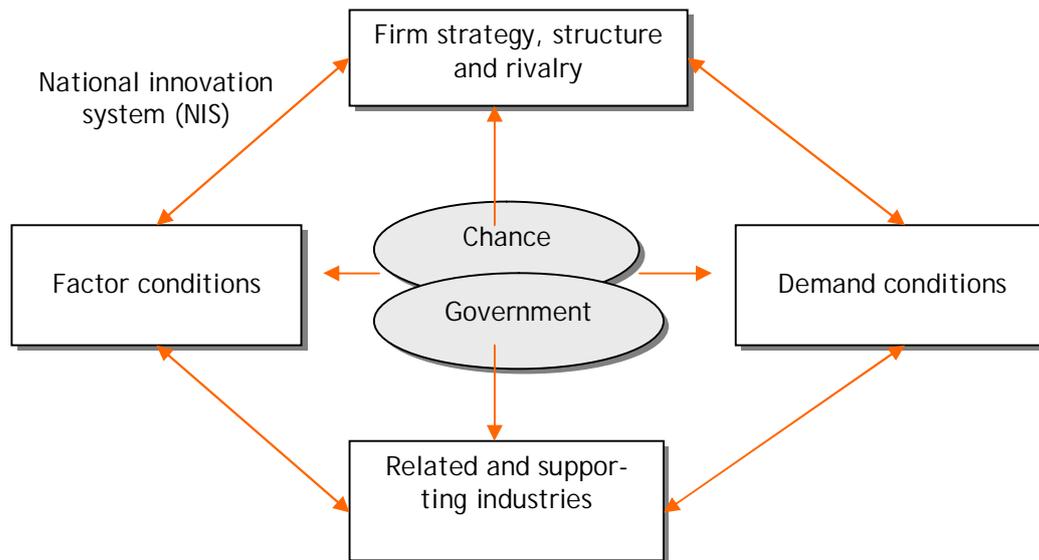


Figure 11. Porter's diamond model

As important as Porter's contribution to the development of cluster research has been his diamond model that explains the competitiveness of industries and nations. In many Finnish studies these two models developed by Porter have been used in the context of foresight analyses. The cluster approach has become a standard framework for policy-making in Finland and a wide spectrum of analytical methods and techniques is used in the empirical research. Critics argue justifiably that the diversity of approaches means that results and conclusions cannot be compared across countries and industries. A counter-argument is that the versatility demonstrates the flexibility of the approach, enabling the user to consider country-specific factors and to focus on relevant research problems accordingly. In cluster analyses the typical methodologies are innovation surveys, input-output-analyses and matrices, qualitative analyses combined with trade statistics and national accounts. In Finland clusters have been seen as unique combination of firms (Roelandt & Hertog 1999a, 1999b, Hernesniemi, Lammi & Ylä-Anttila 1996). However, special attention in Finnish cluster analyses are paid to the ICT cluster, forest cluster, metal cluster and knowledge intensive business services.

Common to the evolving Finnish cluster policies was the incorporation of the traditional industrial and regional policies with science and technology policies (see e.g. Lemola 2002). However, since the countries differed in their initial economic conditions and cluster interpretations they arrived at different policy priorities. In general, Boekholt and Thuriaux (1999) have distinguished four policy regimes, grouped as models. The national advantage model, which directly follows the Porterian line of reasoning, aims to improve the competitive conditions of clusters that are, based on certain criteria, important for a country (e.g., Finland, Denmark and Canada). For the small and medium-sized enterprises (SME) model, the cluster policy is equivalent to promoting networking between SMEs. Here, public agencies work as brokers to initiate collaboration, which is usually a prerequisite for enterprise innovation (e.g., USA, New Zealand, Australia and Norway).

Initiatives to stimulate clustering have been most explicit at the sub-national level, where the outcome has been dependent on, among other things, the distribution of decision-making power between the central and local authorities. This regional policy model is also in line with Porter's argument in that many of the competitive advantages policy-making of nations are actually local (e.g., Wales, Styria and the Basque region). The fourth policy approach can be called the research-industry relations model, where the principal objective is to stimulate collaboration between industry and research institutes to make better use of public knowledge resources. Here the focus is on creating networks within spatially concentrated centres of excellence, especially around the emerging technologies. In the case of Finland all these approaches have been used in cluster policies. (Viitamo 2001, 19–20, Ali-Yrkkö & Hermans 2002)

A good example of cluster analyses in the foresight field is provided in the summary report on ESF projects, where the key clusters' (10 clusters in Finland) strategic importance was evaluated. Key clusters are the engines of production and employment in the economy. Their output and employment are significant and rapidly increasing. In the optimum case, but only seldom in reality, all these favourable conditions are simultaneously fulfilled. In the Future of the Finnish Key Clusters project, the key clusters were defined by using a new, formal method. The intermediate transactions between industries and the input-output table representing them were chosen as the starting point. In total, the information available consisted of inter-industry linkages between 68 industries. In other words, over 4000 bilateral linkages between the industries were analysed. Additionally, data on export ratios, describing international transactions, and on investments, which provides an indication of the technological relations between the different industries, were employed in the study. (Hernesniemi, Kymäläinen, Mäkelä, Rantala, Rautkylä-Willey & Valtakari 2001)

Table 5. Key clusters in Finland and foresight summaries up to the year 2015 (Hernesniemi, Kymäläinen, Mäkelä, Rantala, Rautkylä-Willey & Valtakari 2001)

Cluster	Average yearly growth % 2001-2015		Future development prospects
	Production	Employment	
Information and communications cluster	8,1	-0,4	The challenge is to master technology and within teleoperations to grow to the size of a global player.
Forest cluster	2,4	-1,5	The forest industry utilises expertise globally. New information technologies may form a challenge.
Metal processing cluster	3,1	-0,6	Growth by planned investments and accomplished alliances. The transfer of knowledge to the next generation.
Mechanical engineering cluster	2,8	-0,2	Technological leadership in intelligent machines and systems. Global usage and maintenance.
Foodstuffs cluster	1,4	-0,8	The EU disturbed the market. The take-over of the Baltic and Russian market is a possibility.
Business services cluster	3,3	2,8	Own innovation activities and new services. Penetration into public services.
Construction cluster	2,3	1,1	Business cycles, quality
Energy cluster	3,2	-1,8	Environmentalism has increased the exports of Finnish energy technologies. Energy industry companies have to grow and become global players.
Healthcare cluster	2,2	1,5	Ageing and the rising standard of living have increased the demand for services. Product visualisation, entrepreneurship and technology utilisation are required.
Other Industries	2,3	0,7	A budding service cluster is emerging around the travel industry, which may develop into a key cluster in the future.
Overall industries	3,2	0,7	The adoption of telecommunication and information technology and new economy principles in the traditional clusters.

4. FINNISH FORESIGHT SYSTEM: SOME GENERAL OBSERVATIONS

The general situation regarding Finnish foresight activities indicates that there are many foresight activities in Finland. The general observation is that the Finnish foresight system is, on the whole, very institutionalized and sophisticated. The latest phase of development has been ministerial co-operation and the integration of foresight activities. On the other hand some important developments have also been done made on the regional level e.g. the TKTT foresight system, which was presented in this survey paper.

There are various different forms of foresight activities in Finland: (1) National ministry level foresight systems, (2) a parliamentary policy level foresight system (Futures Committee), (3) industrial and economic forecasting and foresight systems (especially ETLA and the EK Education Intelligence system), (4) the larger technology foresight systems of SITRA, Tekes and VTT and (5) the regional foresight activities of the TE centres and regional municipalities, (6) foresight activities and processes of companies and corporations (e.g. Nokia Research Centre, Insight and Foresight Unit).

There are also numerous organisational foresight activities in Finland, which can be seen in a variety of active organizational foresight cultures and networks. An especially strong aspect of the Finnish foresight system is the technology foresight system, which key national organisations, e.g. Tekes and Nokia, use well when co-operating on larger foresight programmes. A good example of such cooperation was the Finnsight 2015 project between Tekes and the Academy of Finland.

A special character of the Finnish foresight activities has been to use the cluster approach of Porter (1985, 1990), which has been used in national policy formulations, but also in regional foresight analyses. For Finland a special advantage has been good co-operation with regard to foresight activities/actors, educational activities/actors and innovation system activities/actors.

What are the key problems of the Finnish foresight system? Ten problem areas in the Finnish foresight system:

1. Vague frameworks and networks for organising regional foresight

This problem has been a long term issue for Finnish foresight activities. Too often there are unplanned changes to frameworks and networks of national and regional foresight activities. This means that in many cases all foresight activities start from point zero after some political "reforms" and "new ideas".

2. Incomplete co-operation between stakeholders and actors in foresight projects

In Finland there is a tendency to invent a wheel again. Every stakeholder and actor produces their own foresight exercises without any larger cooperation and integration activities. This is also an European problem. There is not enough cooperation and coordination in the foresight field.

3. Imperfect and weak links between national and regional foresight activities

There are still imperfect or weak links between national and regional foresight activities. Knowledge sharing and dissemination is often poorly implemented after large national and regional foresight activities. This means good outcomes and results are partly wasted. The connection between foresight results and decision-making is not strong enough.

4. Power tensions between ministries organising foresight activities

There are some typical power games between ministries. Sometimes there seems to be a political need to find a "superministry", which would take care of all the foresight activities. However, too centralised a system may not be effective in the modern network society.

5. Not enough time for foresight analyses

Many foresight activities still use only a short-run time horizon at the expense of long-run visions and strategies. This approach leads easily to opportunistic tactics within national and regional politics. Typically it leads to a very linear and self-evident approach for foreseeing the future.

6. Measuring and maximizing the impact of regional and national foresight activities

Many public sector authorities are not interested in evaluating the impacts of regional and national foresight activities. This kind of attitude leads to imperfect learning processes in many organisations. It is important to have some kind of post-evaluation phase after the foresight processes.

7. The merits and challenges of foresight in less developed regions in Finland

Less developed regions and local communities have only limited material and immaterial resources for implementing local and regional foresight projects. Having such resources is important as all regions face similar problems due to the fact that differing standards of living between different areas are common to all regions. We can speak of differentiation with respect to demographic and demographic segmentation as well as socio-economic and ethnic segregation. Segregation and segmentation in cities indicates the impact of general processes that affect the standard of living for individuals and households. Here it is important to keep in mind the difference between the standard of living for individuals and households ("people poverty") and the qualities of an area ("place poverty"). Differentiation as such is not necessarily a big problem, but the polarisation between the have and the have-nots is. These kinds of unequal social and economic

conditions also affect the merits and challenges of foresight in less developed regions in Finland. Nevertheless, the problem of inequality requires more attention in the context of foresight studies.

8. The flexible adoption of novel foresight methods and activities.

There is a need to develop education and consciously build foresight tools and methods. In recent years many new foresight tools and methods have been developed, but only a small part of them have been used in practice. Thus, there is still only a limited understanding of the possibilities and the range of the analytical and interpretative methodological options available to practitioners and organisations for recognising the strengths and weaknesses of key methodologies and tools, and their suitability for various purposes.

9. Problems in mobilising regional foresight actors, stakeholders and administrative and political decision-makers

In many foresight projects it is difficult to mobilise different actors and stakeholders to participate in foresight project and programmes. These kinds of problems lead easily to failures in participation processes and weak democratic practices. The participation of people and their organisations is required in order to influence institutions, policies and processes that ensure equitable and sustainable development, strong democracy and democratic institutions in Europe.

10. Foresight co-operation within cross-border cooperation

In Europe and Finland there is a strong need to undertake cross-border cooperation in the field of foresight activities. Unfortunately there are only few foresight projects which focus on the interregional aspects of European futures. For example, in the future the forecasting approach of the long term labour force and their training needs should take place at an international or Pan-European level. Such a need has been already strongly apparent in some smaller countries that have relatively large migration or commuting flows. The need is seen as an emerging need given globalisation and the increasingly international perspective of young people in taking decisions relating to education and employment.

European perspective

From a larger European perspective, it would be useful to further integrate foresight activities into the Lisbon strategy and its evaluation and re-formulation phases. In March 2005 the European Council called upon the Commission, the Council and the Member States to re-launch the Lisbon strategy by refocusing on growth and employment in Europe in accordance with the Commission's proposals. In addition, local and regional governments also have to play a key role in implementing the Lisbon strategy. National innovation and education policies are needed to promote the development of regional innovation systems. Local and regional actors should also be encouraged to use financial incentives in order to achieve the Lisbon goals. EU territorial and cross-border cooperation were also on the meeting's agenda. The meeting noted that significant progress has been made in developing new instruments for strengthening economic and social cohesion in the Union. In particular cooperation under the new European Neighborhood and Part-

nership Instrument (ENP) will play a significant role in the development of regions across the Union's external borders. Issues like trade and economic integration, mobility and migration, regional conflicts and the threat of terrorism are all dealt with in the ENP strategy (Mooij and Tang, 2003, Commission of the European Communities 2005, Commission of the European Communities 2006).

It would be useful to further develop national and cross-border foresight systems in such a way that they also strengthen European neighbourhood and partnership policies. Futures oriented new competences are one strategic key issue in the Lisbon strategy. According to the Lisbon Strategy, the EU must become the most competitive and dynamic knowledge-based economy in the world and capable of producing sustainable economic growth and creating more and better jobs that generate greater social cohesion (Commission of the European Communities 2005).

To achieve this ambitious Lisbon strategy goal, Heads of States and Government asked for not only a radical transformation of the European economy but also a challenging programme aimed at the modernisation of social welfare and education systems (see e.g. Jacobs 2004). One of the most important Lisbon policies is a better use of human capital in the economy. This priority becomes even more prominent when considering Europe's ageing population in the next decades. According to new reformulated Lisbon strategy, Europe should be the world leader in terms of the quality of its education and training systems. This is also a relevant target for Finland. Making this happen will mean a fundamental transformation of education and training throughout Europe. This process of change will be carried out in each country according to national contexts and traditions and will be driven forward by cooperation between member states at European level, through the sharing of experiences, working towards common goals and learning from what has worked best elsewhere. (Commission of the European Communities 2005)

Key European foresight players should, however, express an interest and commitment in participating in the foresight processes and in using the results. If they do, it will be possible to learn important lessons from the joint efforts of all the European countries, as well as the cross-border exercises where selected counties/regions are involved. Well designed, foresight exercises can generate new knowledge that is shared by the key actors in all the EU countries. This knowledge can be used to develop R&D and its infrastructure as well as to help shape international norms and influence the content of international foresight research programs. Due to their different cultural backgrounds, EU countries could thus play a more important role in promoting equality and well-being in an increasingly technocratic and global world.

11. The evaluation of regional and national evaluation results

The analyses presented above indicate that there should be an established permanent evaluation round practice for analysing the results of national and European foresight activities. This kind of permanent institutionalised practice would reveal more about existing and future development needs within national and regional foresight systems. Furthermore, if stakeholders involved in foresight always know that there will be an evaluation phase this should motivate them to increase their efficiency. The future developments of the Finnish foresight system should be based on the results of evaluations.

5. SUMMARY

In terms of purpose, some common and typical goals for work life foresight are: (1) Exploring future opportunities so as to set priorities for investment in science and innovation activities as well as in public and private sector organisations, (2) the reorienting of science and innovation systems, (3) demonstrating the vitality of the science and innovation systems, (4) bringing new actors into the strategic debate of work life policies, (5) building new networks and linkages across fields, sectors and markets or around work life problems. All these typical goals for foresight are connected to work life and work place changes.

It is useful to know that there have been various efforts aimed at developing foresight research in Europe. In particular, Finnish experts and foresight agencies have cooperated in Europe in the context of (1) COST A22 (CORDIS Foresight methodologies network, www.costa22.org/mou.php), (2) the European Foresight Monitoring Network (EFMNm, www.costa22.org/mou.php), (3) the For Society network (www.eranet-forsociety.net/ForSociety/index.html) and FUTURREG (www.futurreg.net).

These European foresight projects have focused much on methodologies and the dissemination of foresight activities. They also provide a good knowledge base for work life foresight research projects. For example, the "Handbook of Knowledge Society Foresight" was produced by the European Foundation (Keenan, Loverigde, Miles and Kaivo-oja 2006).

One large challenge for Europe is that all this vast accumulated expertise should be utilised within work life and in the field of work place research. Thus how is it possible to boost the Lisbon strategy on the basis of foresight research? The answer to that question is not simple. The Finnish experience clearly indicates that foresight activities should focus on critical fields, which are (1) education (competence and qualification foresight studies, future education needs etc.) (2) labour markets (the demand for and supply of a work force, the balance between supply and demand), (3) innovation systems (technology and science foresight) and (4) the logic of networking (cluster foresight studies). This paper has described some recent key foresight projects and programmes in Finland. Surveys of this type are not comprehensive, but do include some important foresight insights concerning foresight in Finland.

Although Finland has been involved in the fields of forecast and foresight no formal large-scale national foresight activities have been performed at any stage. In 2001 the Ministry of Trade and Industry produced a study according to which it is not reasonable to carry out individual large scale foresight projects in Finland. It stated that more attention should be paid to the dissemination of foresight projects through the Foresight Forum and other channels like the Futures Committee and networking activities. Accordingly, the Finnish strategy has been a decentralised strategy, not a large macroeconomic master

plan strategy. This study also suggests that we should concentrate on improving the coordination of the already existing foresight activities and launching specifically targeted foresight projects.

Today a critical element of successful foresight activities seems to be effective networking and not large macroeconomic master plans. However, the coordination and integration of foresight activities seem to be a real problem within the Finnish foresight system. This is probably also a larger European problem. However, one solution for Finland was to develop the Foresight Forum (Ennakointifoorumi) and continue that with SITRA's Finnish foresight web environment (www.foresight.fi), which shall be launched in December 2008.

One very interesting direction in foresight activities is the development of a social media for foresight activities. A lot of valuable foresight information and knowledge is missed by different organisations and institutions but that could be redressed if a social media could be developed to help spread best practices. In economic terms, Finland has performed well in reaching the Lisbon strategy targets.

The Finnish foresight system has quite comprehensive systems and foresight as research activity is partly institutionalised e.g. the Finnish Parliament has a futures committee. This is a special characteristic of the Finnish foresight system, which can also be used to describe it as an institutionalised foresight system that has national ministerial level and also regional level foresight systems with different activities.

Many national and regional foresight processes are becoming trans-boundary foresight processes because of the globalisation process. According to the Lisbon strategy foresight projects should be launched at national, regional and local levels in order to promote the achievement of the objectives of the Lisbon strategy; economic growth, full employment, social cohesion and governance. Unfortunately this idea has not been fully understood in all the EU member countries. A new reformulated Lisbon strategy would mean more challenges for foresight research, especially for the foresight analyses of Europe's educational and competence requirements.

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