



# European knowledge society foresight: The Euforia project synthesis

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# Preface

This report is in four parts.

The first part is a general introduction that sets the Euforia project in its context. It explains why the project was carried out and explicates some important matters affecting the nature of the project - not least that this is to be seen as a pilot study rather than a definitive one. It also introduces the concept of a knowledge society (hereafter KS), which is explored in greater depth in appendix 1.

The second part provides the most detailed account of the project's substantive results. It describes the outcomes of the project, as derived from the different activities that were undertaken: cross-national workshops and Delphi survey, national workshops and country-specific Delphi analyses and efforts at synthesis of the rich material yielded.

Part three returns to the matter of KS foresight. It describes the steps in implementing the project. This documentation will enable a greater understanding of the outcomes described in part two, which are highly intertwined with the processes employed. The process used in the Euforia study is not described in any other publication or in any previous reports to the European Foundation for the Improvement of Living and Working Conditions (hence the Foundation). This part details the lessons learned from the project that have direct and important relevance to the future application of foresight processes to study the emergence of a KS in the EU 15 (or more widely). Some of these lessons may be of interest to those concerned with applying foresight to social affairs more generally.

The last part summarises key recommendations arising from the study.

# 1

## The Euforia project - context

### Introduction

Knowledge society (KS) is not just an increasingly popular term among journalists and futurists. It is inspiring visions of a future EU society, most notably in the form set out in the Lisbon Council's objectives for the creation of an EU 'knowledge-based economy' as a central goal for 2010. Many governmental and intergovernmental agencies are using the term in their strategic analyses.<sup>1</sup> There are many unanswered questions relating to this achievement, including:

- what is a KS;
- how far are we toward attaining (what features of) it;
- which countries and regions - and even social groups - are most advanced in respect to one or other feature of a KS;
- is it right to think about the KS, or are there likely to be a variety of viable KS, differing in some or even many features - round the world, or even within Europe;
- if so, what factors influence the rate of development and direction of development of KS;
- are there liable to be successive 'stages' of KS, as there have been for industrial societies? Should KS be seen as a successor to industrial society, or itself as yet one more 'stage' of industrialism;
- what are the implications of the KS for living conditions, working conditions, and industrial relations? Are these social dimensions among the core or more contingent features of KS;
- how can we make informed choices about what sort of KS we want for our future?

These questions illustrate the complexity of any study that looks into the emergence of a KS anywhere in the world. They also reveal the potential conflict between simple cause and effect models and those that acknowledge the complexity of living systems that are always far from equilibrium, as is the case for all social systems. These are matters that will be returned to shortly.

Throughout the text the term 'EU' is restricted to the EU 15. Early in the study, it was determined that to take into account the transformations underway in accession countries would add too many layers of complexity to the study.

### The Euforia study

The Euforia project was commissioned by the European Foundation for the Improvement of Living and Working Conditions (the Foundation) in the context of its four-year research programme, *Analysing and anticipating change to support socio-economic progress 2001-2004*. Part of this programme launched what was labelled the 'European knowledge society (KS) foresights for living conditions, working conditions and industrial relations' study. This, the genesis of the Euforia project, was to create a structured process by which such questions might be illuminated. Following the methodological work involved in development of the *Handbook of knowledge society foresight*,<sup>2</sup> Euforia was launched as a pilot study. It was designed to see how far foresight methods could be used to throw light on the

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<sup>1</sup> A Google search on 'knowledge society' in November 2003 resulted in some 66,500 'hits'; over half of the first twenty of these were from national governments (from Ireland to Thailand), or from EU or UN agencies. Some of the other hits appear to be regional agencies.

<sup>2</sup> M Keenan, I Miles, J Kaivo-Ova, 2003 Handbook of knowledge society foresight, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at: <http://www.eurofound.eu.int/transversal/foresight.htm>

relevance of KS concepts and characteristics for the Foundation's key areas of concern, and thus for its future programmes.

Euforia has thus explored how a viable process can be created to study the KS, using a range of foresight methods, and taking three EU countries - Finland, Greece and Germany - as its test cases. The purpose of the project was to increase understanding of the 'drivers' of a KS and to anticipate their potential impacts on living conditions, working conditions and industrial relations.

As a 'developmental' project, Euforia was a new type of project for the Foundation, which was intended to have a number of parallel features, namely to be:

- *integrative*: 'the project should take into account living conditions, working conditions and industrial relations.' To achieve this, Euforia explicitly focused on these three areas in the analyses of a KS through the elaboration of advancement indicators, scenario workshops, the national reports and the final synthesis report;
- *explorative*: the 'project should explore new ideas, new issues, new methods, and be creative.' Euforia explored new ideas and issues in the course of the preparation of background reports for the workshops and in the interaction with experts in these workshops. It applied new methods to the administration of a Delphi survey and other questionnaires by means of Web tools, and used the outcome of the Delphi in scenario methods, which have been adapted to the topics under study;
- *experimental*: the 'project should try different working and analysing methods in order to produce useful information, ideas and knowledge in the more complex society.' Euforia worked with standard quantitative data and forecasting tools as well as with qualitative approaches based on expert judgement; the information and results are presented in a variety of formats;
- *forward-looking*: 'projects should anticipate the future and be future-oriented in order to help social partners, the Commission and the citizen to develop living conditions, working conditions and industrial relations; should deal with issues which are important and which will help to anticipate future trends and policy actions; should help avoid being unsuccessful, and strengthen the desired paths of development.' A core element of the foresight procedures used in Euforia has been that they are oriented to involving a wider range of stakeholders in sharing long-term appraisals and strategic considerations, and to linking such appraisals to action that can enhance the prospects of moving in more progressive directions.

In this way, the project encompassed research, network building and the exchange of information and expertise with KS specialists, social partners and the state. The project was also intended to link with the CEC's sixth *European Research Programme 2002-2006*, concerning network building and the innovation policy framework of the European Research Area. The project is also closely related to the goals of the declaration of the Lisbon Council. The project's relation to the declaration lies through investigating how social foresight can fill the gap between the Lisbon Council employment strategy and technology foresight.

The Euforia project outputs are rather more elaborate than originally proposed, and now consist of:

- comparative statistical analysis on the development of a KS based on conceptual and indicator analysis of various dimensions of KS;
- preparation and analysis of a Delphi study appraising KS potentials for the EU and its member states;

- analysis of the evolution of KS in the three selected countries, based on national foresight workshops - and preceded by a cross-national workshop - examining 'drivers of the knowledge society';
- reports based on further foresight workshops in these countries, considering alternative scenarios of KS development and their implications for living conditions, working conditions and industrial relations;
- the present synthesis report.

In addition, the original plan specified that the project should also be 'geared to the current/topical issues facing the European Union.' Euforia could not hope to address all of the topical issues that foresight might address. Indeed, a great many important social trends with major implications for the Foundation's areas of concern could not be tackled within the severe resource constraints. For instance, it was not possible to tackle the influence of such diverse problems as:

- terrorism;
- environmental sustainability;
- biotechnology applied in food, non-food crops and in health.

These issues, and many more, are liable to be crucial for the evolution of living conditions, working conditions and industrial relations in a knowledge society. But Euforia was not intended to be a comprehensive foresight study. To reiterate, it was merely a pilot application of foresight approaches to the concerns of the Foundation conducted in the light of some perceived core KS developments believed to be central issues for the EU, as indicated by the Lisbon and Barcelona summits. The modest nature of the project leads the Euforia project team to caution against simplistic extension of the outcomes into fields and uses that the data and information reported on here do not support.

## **Approaching the knowledge society**

### **The Lisbon Council's objectives**

The Lisbon Council of March 2000 aimed to invigorate the Community's policies and to define long-term targets and measures. In part, it was prompted by the advent of the new millennium, a good time at which to take stock and move on. But it was also motivated by an unease about the EU's economic and technological performance compared to its major competitors.

The Council resulted in the 'Lisbon objectives'. These specify that the European Union should, by 2010, 'become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion.'

Achieving this goal was seen to require an overall strategy aimed at:

- preparing the transition to a knowledge-based economy and society by better policies for the information society and R&D, as well as by stepping up the process of structural reform for competitiveness and innovation, and by completing the internal market;
- modernising the European social model, investing in people and combating social exclusion;
- sustaining the healthy economic outlook and favourable growth prospects by applying an appropriate macro-economic policy mix.

Considerable emphasis was put on the role of Information Technology (IT).<sup>3</sup> The report refers to ‘The sudden arrival and growing importance of information and communication technologies (ICT) in professional and private life’. Given that the new technology has been entering homes and workplaces since the 1970s, and stimulating much public debate and scholarly research since the early 1980s,<sup>4</sup> this comment is surprising. Presumably it refers to current generations of IT, especially advanced networking systems and pervasive connectivity. In any case, IT is identified as the immediate technological challenge and as offering a significant opportunity for job creation. Ubiquitous access to the information society for all, regardless of social category, race, religion or gender, has the potential to improve the quality of life, competitiveness and job creation. A simultaneous economic and social transition is required, but this should not disadvantage certain categories of citizen and needs so that the benefits of economic well-being are distributed equitably. The EU’s backwardness in many aspects of IT development and use, compared to the US in particular, but also Japan (and other countries such as Korea), was seen as a major problem.

Exactly what is meant by the knowledge-based economy is not delineated in great detail, but the Council report discusses a number of related issues. One is *education for the knowledge economy*. The inverse relationship between the level of education and rate of unemployment is noted, and a quantitative objective set for 2010. This is for a halving of the number of 18 to 24 year olds with only basic secondary education. *Better co-ordination of teaching and research at European level* is another topic, where networking is seen as important for achieving this through national and joint research programmes. All obstacles to the mobility of researchers in Europe should be eliminated. The creation of a *very high-capacity trans-European communications network* is another necessary element of the European knowledge economy.

The nature of the knowledge-based economy involves the production of knowledge (research), its communication, and its reproduction in terms of raised educational standards (a knowledgeable citizenry and workforce). There are many other topics that might be addressed in this context. For instance, not all knowledge stems from research, and not all communities of practice comprise teachers and/or researchers. The effective application of knowledge, for instance, in the economy and in social spheres, will be fostered by better education, but there are clearly many other aspects to this. The notion of the KS points us in these directions. Additionally there are important debates about whether there are changes in the mode of production of scientific knowledge, in systems for assessing quality and relevance of research, and in the compact between science and other elements of society, more generally.<sup>5</sup> Some commentators argue that these actually are central aspects of KS.

The Euforia project uses a foresight-based process to try to bring more clarity to the notion of a KS. It bears in mind the Lisbon objectives, and asks some questions about whether and how they can be achieved - though it does not use all of the means that are necessary to tackle such a policy question.<sup>6</sup> But it is also designed around the need to cast light on the areas of key concern to the Foundation - living and working conditions and industrial relations - and thus tackles a particular segment of the KS problem.

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<sup>3</sup> The term ICT - information and communications technology - was used in the Lisbon Council report. The authors of the present report prefer IT, since this encompasses all of the things done with information - including communicating it.

<sup>4</sup> The Commission was sponsoring future-oriented studies of the IT revolution in the 1970s and 80s (e.g. in the FAST programme).

<sup>5</sup> See especially the following books, and the debates they have triggered: M. Gibbons, C. Limoges, H. Nowotny, S. Schwartzman, P. Scott, and M. Trow, 1995, *The New Production of Knowledge*, London, Sage; H. Nowotny, P. Scott, and M. Gibbons, 2001, *Re-Thinking Science: Knowledge and the Public in an Age of Uncertainty*, London: Polity Press.

<sup>6</sup> For instance econometric modelling, policy analysis methods, etc. There is a considerable debate about the reality of supposed differences in growth and productivity between the EU and the US, where no consensus has yet been reached by economic statisticians - other than that differences are sometimes overstated by failure to take into account differences in working hours, the social contexts of unemployment (such as prison populations) and so on.

This leads to an interesting question. How do these areas relate to the Lisbon Strategy? Are they secondary issues, parts of a superstructure for which the 'knowledge-based economy' is the base? Or are they more integral - in which case they would be effectively a 'missing link' in the Lisbon Strategy. In other words, if these topics are important features of the KS, then what are the consequences of neglecting them, and what can be gained from explicating them here? Are there any gaps and limitations in the dominant thinking about KS that are liable to impede the EU's realisation of being the most dynamic and competitive knowledge-based economy by 2010? This project may not be able to answer this question definitively, but the analysis that follows should demonstrate that the Lisbon Objectives - and the trend to a KS more generally - bring up many issues that are important for the mission of the Foundation and those of other agencies.

### **Towards the knowledge society**

The Euforia project has gone some way toward clarifying the notion of a KS and providing insight into its empirical development and potentials. However, this does not mean that it was possible to solve all the definitional, conceptual, or practical issues that arise in this context. KS is a complex issue, and Euforia cannot render this complexity much more manageable.

What Euforia does attempt is to provide a well-grounded appraisal of the presently perceived character of a KS. Before discussing the study results that constitute this, one needs to look at some major points that arise in the research and policy debates about KS.

The term KS has replaced the 'information society' in policy debate to some extent, though this remains a popular term. (Other formulations, such as 'post-industrial society' seem to be in decline; while others, like 'post-modern society' evoke controversy equal to that of a KS.) KS (or its close relatives the 'knowledge-based economy' and 'knowledge-driven economy') has become a popular reference point for policymakers in the OECD, EC and many national governments.

Some of the complications in the debate about KS reflect the fact that the term has been taken up in two distinct, but related ways:

- to describe trends and developments that are already apparent. As a descriptive term, KS is meant to point to new dynamics of industrial growth and innovation experienced in recent decades. This sense of the term is apparent in many OECD studies, for example;
- to envision potential directions of development, opportunities that can be grasped to do things in new and better ways. KS ideas are used by all national governments in expressing their aims for their societies, as the route to renewed growth, greater prosperity and better quality jobs. This sense of the term is manifest in the Lisbon Objectives and many national government documents.

In both cases, the KS is an hypothesis. Descriptively, the hypothesis is that there is something sufficiently distinctive and important to warrant application of the label to the current (or emerging) epoch. Aspirationally, the hypothesis is that this desirable state of affairs can actually be attained.

Terms like KS and 'information society' are widely deployed, but they also receive a great deal of criticism. Critics argue that, compared to a term like 'industrial society', these new labels are fuzzy concepts. Factories may have been in existence in earlier centuries, but the scale of factory development, the move of many craft activities into factories and their transformation into industrial activities, the mechanisation of these activities and the application of new energy sources to them - these developments, unprecedented in scale and speed, marked out the contours of an industrial revolution in 19th century Europe. But is there something equivalent in the use of information and knowledge? Surely, the critics say, information and knowledge have always been used pervasively in our social and economic activities?

It is argued below that the term KS can be applied usefully to signify features of the present epoch that differentiate this epoch from earlier societies - all of which have been knowledge-producing and information-using. The argument is more fully elaborated in an appendix to this report.

### Hypothesis of a knowledge society

The 'information society' can be related readily to an underpinning technology and a recognisable body of knowledge.<sup>7</sup> Although a KS is not so easily pinned down as its close relation, the rationale for using the term KS is to indicate that there are other developments, beyond those concerning the information society, that are often mutually reinforcing. The KS then may be thought of as referring to a far-reaching and complex set of key developments that evolve together and interact intimately; a KS has emergent properties.

The hypothesis is that KS refers to something distinctive, when that can be recognised, that is growing in the present epoch and points to the intersection of several related trends of the late 20th and early 21st centuries. An account in *Innovation Tomorrow* points to:

- The information society's ongoing evolution and to its undergoing shift toward the **pervasiveness of networked computing power**, as compared to earlier generations of stand-alone and one-to-one computing;
- The increasing **importance of innovation** as a source of competitiveness and an instrument for increasing the efficiency and effectiveness of organisations of all types. Innovation is the widespread application of knowledge to establish new ways of doing things. Innovation has become a hallmark of successful firms and nations, and is seen increasingly as a tool for administrative reform and modernisation involving organisational and technological innovation, and to the ways in which innovation occurs and how ideas to make organisations conducive to innovation are diffused;
- The development of **service economies**, a notion at the heart of theories of 'post-industrialism,' has tended to stress service sectors and their involvement in delivering intangible products to specific clients (it stressed information processing and human interaction). It is true that statistically such sectors dominate economic activity and employment. 'Service' is an important management principle in organisations in all sectors and specialised forms provide critical inputs to organisations in all sectors on a major scale;
- **Social learning** involves a substantial investment in improving education and training, and to determine what sorts of skills and knowledge are socially and economically important. At a policy level, the idea of 'lifelong learning' has been widely recognised as a key priority, with emphasis being given to enabling people to be adaptable and acquire new skills and knowledge - as informed workers, citizens and consumers. (Perhaps adaptability will itself be seen as a critical skill.) In organisations of various types, more prominence is being given to efforts to create 'learning organisations' and institute various forms of 'knowledge management'. This goes beyond simply measuring and documenting intellectual capital, and includes a range of practical steps to improve production and the utilisation of critical knowledge. Thus organisations seek to improve their use of existing data resources, to codify and distribute their information assets to their staff (e.g. Enterprise Resource Systems), and to make their expertise more readily identifiable and locatable for undertaking both routine and new activities (e.g. human resource development, groupware and collaborative systems).
- These developments are stimulated further by the competitive and other challenges associated with **globalisation** and act to further reinforce the trend toward globalisation. Thus, there is increased emphasis on removing trade barriers and investment in services and intangibles. IT is used to coordinate decision-making and innovation activities on a world scale. Whether globalisation should be seen as an intrinsic feature of a KS or as a feature that shapes and speeds its development is controversial, though most often it is included as a central feature.

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<sup>7</sup> Cf. Alistair Duff (2000), *Information Society Studies*, London, Routledge.



The items in bold above are being put forward as characteristics of a KS. There are many other visible phenomena that could be related to a KS in practice and that are likely to shape its continuing evolution. As noted earlier, KS is also a normative concept. We can specify that we want a KS that is sustainable, creates high quality jobs, is socially equitable and so on. Since this sort of KS is an EU policy goal, it is important to explore how far societies are advancing towards these objectives and how they are doing so. It is also important to examine expert opinion as to what other features of KS might be anticipated, and here foresight methods have a particular role to play.

The key developments of a KS may have substantial implications for living and working conditions, and industrial relations because their implications for

- new technology;
- service economies;
- learning organisations; and
- innovation

in a general context of globalisation are liable to vary across different times and places. The 'impacts' of the developments will vary, partly as a result of varying starting conditions (factor endowments, cultural assets, established working practices and organisations) and partly as a matter of strategic choices (such as government, corporate and social movement policies).<sup>8</sup>

Perhaps the only set of topics that might be regarded as displaying similar characteristics and to be part of the 'KS complex' are those trends in social values and lifestyles that are sometimes referred to as 'post-modernism'. These are associated with everything ranging from:

- cultural attitudes to science and technology (and associated expertise);
- fragmentation among subcultures and diversity in cultural forms;
- consumer behaviour;
- family living patterns.

A KS might also be associated with the following issues:

- changes in demographic structures in many OECD countries have substantial implications for labour and consumer markets;
- climate change and environmental affairs put sustainability high on the political agenda, though whether this will reshape economic activity remains unclear;
- globalisation and 'offshoring' of work;
- disintegration of public health services in many countries, leading to a decline in health globally;
- the rapid spread of antibiotic resistant forms of bacteria of common infectious diseases.

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<sup>8</sup> It is because of the interaction between 'drivers' and 'impacts' - the ways in which social responses to change are dynamically constructed, rather than being mere passive adaptation - that we prefer to speak of 'implications' rather than 'impacts'.

There is much controversy about developments in these fields and it is, therefore, hard to make a succinct case about the key trends relating to either KS or to post-modernism, as was done in the first bulleted list above. For this reason, these issues above were not taken, at the beginning of the study, to be essential elements of the empirical or aspirational visions of a KS. However, they are not marginal issues and may be crucial in shaping a KS in practice. Because of these influences a KS could take many forms, depending, for instance, upon how environmental challenges are met (e.g. particular energy regimes and responses to climate change). There may be different KS in different countries and regions, just as there have been many types of industrial society. Just as industrial societies have moved through various phases, a KS is liable to be equally dynamic, moving through new phases.<sup>9</sup>

A conclusion from this is that paths of development and of indicators of a KS may fall into two classes:

1. Features that are more or less common, where rates of movement can be more or less rapid. Here it makes most sense to talk about advancement indicators as representing different degrees and rates of movement between two time intervals on broadly common trajectories. Thus all countries effectively move towards being more IT-intensive, their economies are increasingly dominated by services sectors. The indicators of such developments tend to be retrospective - not just in the sense that there is only actual data on past circumstances available, with forecasts using such indicators typically deriving from simple extrapolations or models that assume that current structures and relationships remain largely unchanged. They are also not future oriented, giving little scope for capturing the sorts of qualitative change that frequently impact upon the meaningfulness of any indicator as social circumstances evolve.
2. Features where more diversity can be expected. Diversity may itself stem from diverse sources.
  - (a) Diversity may reflect different starting points - especially if the more 'advanced' countries are continuing to advance at a more rapid rate than the less 'advanced' ones. But even if some catching-up is taking place, some divergence may take place. For instance, a common (though disputed) view among students of international development has been that the process of economic growth first leads to more inequality within the developing country, and then, later, to more equality. If this account is correct, there will be a period in which the developing country is becoming less like the more industrially advanced country in terms of social equality - though eventual convergence in terms both of growth levels and internal equality is predicted by this account. Similar patterns might be expected in respect of such features as IT use, where initial adoption of the new technology is almost always associated with inequality, since early adopters, benefiting from access to the new technology, are typically drawn from more privileged groups. Only as the technology becomes more widely available would we expect to see this kind of inequality diminish.
  - (b) Diversity may reflect different social and institutional frameworks, which means that similar opportunities are treated in very different ways. For example, there is much evidence that typical responses to technical change, in terms of skills structures and management processes, vary considerably from country to country, sector to sector, and even firm to firm in the same sector. Even if the use of IT is generally associated empirically with an upgrading of the skills of the workforce, and IT development and its introduction are likely to require a minimal level of technical skill, very different patterns of response may make most sense in different countries and cultures. This will reflect those particular skills that are already available, the degree of adaptability in management and in labour markets, and the organisational configurations that already exist and how readily

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For an argument that information societies have moved through several stages already, and that the outlines of a new phase are already visible, see I Miles (2003) 'Rethinking Organisation in the Information Society', in G Beckmann, B-J Krings & M Rader (eds) *Across the Divide: Work, Organisation and Social Exclusion in the European Information Society*, Berlin: Edition Sigma.

these can be modified. It might be argued that there is a 'satisficing' model, towards which different countries (or other actors) should be moving, if they are not to pay the price of bad decisions. Given the rapid pace of IT development, we are unlikely to know the details of such an optimal model, since the world will have moved on before they can be established. 'Expert' views as to what arrangements are likely to dominate often stress convergence. Such views, based on partial knowledge, may also reflect commitment to particular strategies and visions. This probably accounts for the overoptimistic expectations about the rapid growth of telework, e-commerce and other aspects of the use of IT. Many key features of living conditions, working conditions and industrial relations fall into this broad set of developments and indicators.

All of society's actors are making decisions under conditions of considerable uncertainty. Even those people with the best understanding of the technical aspects of IT or intellectual assets may be ignorant of associated technological or managerial developments. Given globalisation and modern communications, there is great scope for international diffusion of technology and technique, within limits. IT is an extremely malleable technology. The use of information and intangible assets in production and consumption is similarly something with great scope for creative rearrangement.

Generally, the choices of any one party are strongly conditioned by the choices of others and/or by expectations of what these will be. There is much observation, imitation and learning from others, though this is not always systematic or effective. Equally importantly, the results of the choices of any one party will be strongly conditioned by the choices of others, whether these are:

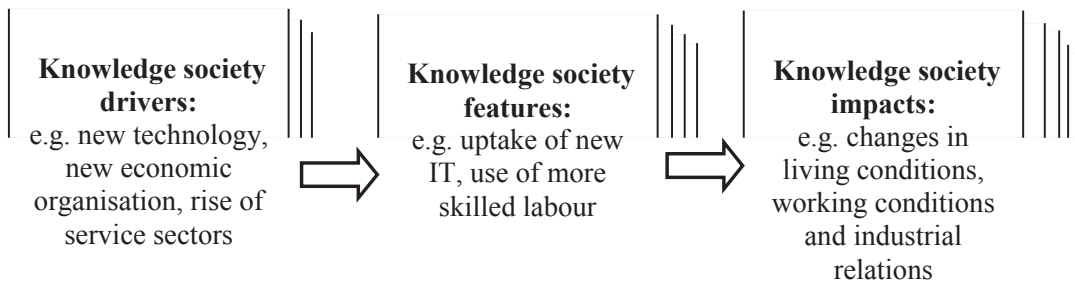
- managers dealing with their employees;
- companies confronting regulators or competitors;
- countries seeking to agree upon common trade or environmental policies.

The choices that party A makes have outcomes that vary according to the choices made by parties B, C and D. The classic prisoners' dilemma is a highly formalised version of such interdependent outcomes. (Here, each of two prisoners has a choice to make, knowing that the consequence of choosing one option will be determined by what option the other prisoner takes.) One can rarely be sure how all the other members of a social system will choose to act. And life is more complicated than the prisoners' dilemma, with parties having varying amounts of freedom to revise their plans and strategies. There is always some uncertainty as to the outcomes of choices.

One way of approaching these issues is through a 'linear model'. This may at first seem rather reminiscent of Marxism's analysis of base and superstructure or the technological determinism common among many non-Marxist social theorists. In (some varieties of) Marxism - and a good deal of other social theory - it is assumed that the fundamental forces driving along social change are located at the economic and technological level. For Marx these forces involved the forces of production (e.g. workers, employers, technology) and the relations of production (ownership, control, division of labour). Other features of social organisation and consciousness evolve on top of this base, with more or less autonomy accorded to them in different accounts. Many other lines of social thought prioritise the techno-economic sphere. Its development clearly does affect the possibility of human action, as it yields wealth, resources, and capabilities to affect the world in new ways. On the other hand, this provision of new possibilities is something rather different from dictating that things have to take specific forms. Famously, ancient China developed a large number of technological innovations that were not applied on a wide scale to economic or military ends, because the social institutions were not conducive to such development. Technology does not simply determine social structure - the two influence each other in different and complex ways and, of course, both 'technology' and 'social structure' are extremely multifaceted and heterogeneous things.

A simple first way of thinking about the emergence and implication of KS is to use a framework such as that of Figure 2.1 below. (The 'layered' effect is intended to communicate the point that, where different drivers are operating, different features may arise; and different features may give rise to different impacts. In other words, there are alternative possible futures.

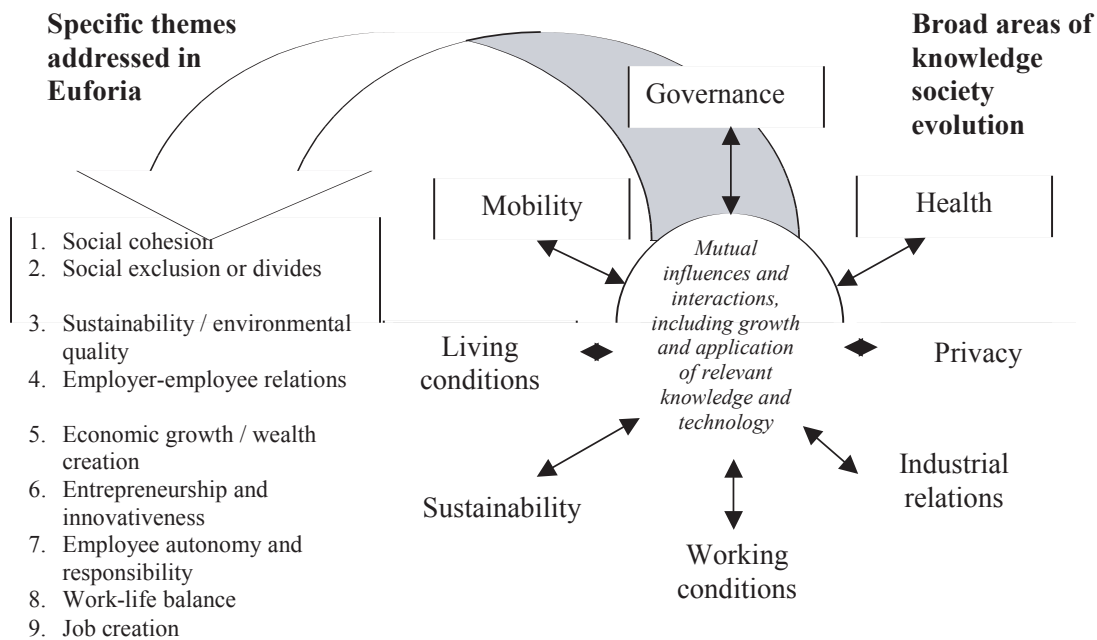
Figure 2.1: A simple framework for the Euforia project



Such a framework is necessarily incomplete. As noted, there are bound to be 'feedback links' between each of the boxes. Complaints about the effects of a new technology at work or in the home ('impacts') may not only influence features of the KS (such as the rate of uptake of this technology) but also influence technology development (a 'driver') itself. If one doubts this, simply consider the R&D effort put into anti-spam measures, user-friendly interfaces, security features in new IT. In the course of the study, many of those who took part in workshops took issue with the terminology used in this figure. 'Drivers' are themselves influenced by other parts of the system, and their relationships with these other elements are more complicated than implied by the implication that these are the essential determining factors, shaping the speed and direction in which everything else travels. 'Impacts' are not the impressions that the active 'drivers' make upon a passive social world. Social actors respond to changing circumstances in active and dynamic ways - limited, of course, by partial knowledge and uneven access to resources, but creatively and often surprisingly.

But, terminology aside, the framework does capture a great deal of the way in which the Euforia project proceeded. This is because projects - and workshops - have to be conducted with at least an element of linearity. Some things have to come first, in the work itself and in how it is presented. But other frameworks were developed to guide the project, and Figure 2.2 outlines how we see KS as involving a number of interrelated areas of social evolution, that can form the basis of specific lines of enquiry into topics relevant to Lisbon Objectives and Foundation concerns.

Figure 2.2: A more elaborate view of the knowledge society



## The knowledge society foresight process

Before presenting detailed results, it is necessary to explain the various elements used in this study. Euforia is intended to provide insights into European developments leading toward a KS. But 'Europe' is a large entity. Few people possess an overview of KS developments across the whole European Union. In contrast, there are many experts with knowledge of one or the other country. Thus, useful results may best be generated by means of a set of country 'case studies'.

The starting point for Euforia was to choose a small set of countries and partner organisation within them with whom the pilot study could be developed. The decision was made to choose countries that represented very different points on the current spread of EU Member States along key advancement indicators. An early selection could be made on the basis of a preliminary set of indicators described for the SIBIS project.<sup>10</sup> From this, it was possible to select two countries that appeared to be at the extremes of development and one in a roughly average position. This selection was facilitated by the high correlation between many of the advancement indicators used in this first appraisal: performance on one of the dimensions tended to be strongly linked to that on other dimensions.

Accordingly, the three countries chosen for the case studies were **Finland** (high on most indicators), **Germany** (occupying a roughly average position within the EU on most indicators) and **Greece** (relatively underdeveloped on most indicators). Similarly, the FFRC, Empirica and Atlantis Consulting agreed to become partners and to set up temporary national foresight centres in Finland, Germany and Greece, respectively.<sup>11</sup>

<sup>10</sup> SIBIS is online at: <http://www.sibis-eu.org/sibis/>. Particular thanks go to Werner Korte

<sup>11</sup> The preliminary indicator list was much revised over the course of the project, but this feature of the data remained fairly constant.

Each case study followed the same basic steps. Reflecting the participatory nature of foresight, however, many details of the processes needed to be defined interactively with the national centres and with local ‘users’ of the study. It was determined that the study would involve a number of major elements, drawing on procedures developed in earlier foresight studies and the methodological and practical guidance provided from previous studies for the Foundation<sup>12</sup>. The key elements of the study are given below. Later chapters and appendices will provide more detail of the processes used.

- **Indicators work** involved several rounds of elaboration of the initial set of advancement indicators produced by Empirica. In addition to dialogue among the partners, and feedback from national workshops, a series of advisory committee and other meetings suggested alternative indicators that might be used; different ways of presenting the results; and requirements for explicating national circumstances. As is often the case when discussing what data would progress the understanding of a topic given ideal circumstances, consideration of alternative indicators helped the further development of conceptualisations of a KS.
- **Cross-national workshop:** The opportunity was taken of building more interactive foresight processes into a conference on Euforia (and related topics). In this workshop, methods of small-group working were employed to gain a preliminary assessment of major drivers of a European KS, and the associated impacts on living conditions, working conditions and industrial relations.
- **National workshops:** Two rounds of national workshops were held, giving six workshops in all. National experts were involved in these. Both considered indicator data and the interpretation to be given to national characteristics. The first set of workshops also reflected especially on drivers and shapers of KS, and made proposals as to useful Delphi questions. The second set of workshops was able to make some use of preliminary Delphi results and concentrated especially on developing scenarios for the KS in the respective countries.
- **Delphi study:** An online Delphi study was launched, in the three national languages (as well as in English), and taken through two rounds. This covered a range of topics concerning the KS developed through discussion at national workshops, among the teams, and with Foundation.
- **Scenario analysis:** Finally, the scenarios developed by the national workshops were assessed by the teams responsible and have been further analysed in the preparation of this report.

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<sup>12</sup> M Keenan, I Miles, J Kaivo-oja (2003), Handbook of knowledge society foresight, European Foundation for the Improvement of Living and Working Conditions, Dublin, available at <http://www.eurofound.eu.int/transversal/foresight.htm>

The results presented here illustrate what the pilot study has to say about the:

- conceptualisation of a KS in general - its characteristics, and the forces that are bringing it into being;
- empirical manifestation of a KS in the different countries chosen for study (and to a lesser extent, in the EU more generally);
- implications of a KS for living and working conditions and industrial relations - the core concerns of the Foundation.

### The KS hypothesis

The very existence of a KS is hotly debated. Some commentators argue that all societies have been knowledge-based and maintain that it is only the specific areas and quantity of knowledge that changes. In this account, successive societies build on their predecessors. Very few, if any, qualitative differences make the current epoch worthy of labelling as a KS. By contrast, other commentators maintain that there are both qualitative and quantitative differences between the current social evolution and earlier stages of development. Both viewpoints have some justification - and both share the same underlying recognition that societies are involved in a continual process of emergence.

Synthesis of the outcome of the Euforia project, either explicitly or implicitly, involves the formulation of mental models of the emergence of a KS. The term emergence has already been used elsewhere in the report in this context. This is deliberate. However a KS is ultimately perceived, its 'signature' will be recognised through emergent properties and not through simple cause and effect steps.

Probing the territory of the future is analogous to making a map of an unknown country without being able to visit the terrain itself<sup>13</sup>. The mapmaker has the advantage of knowing most of the components that the unknown hinterland is likely to be composed of - mountains, rivers, coasts, forests, deserts and ravines to mention just a few geographical features that might be encountered. Such knowledge is denied to the hapless thinker trying to divine the possible terrain of an emerging future society.

All futures thinking, including foresight, involves collapsing future anticipations and expectations back to the present on the basis of current knowledge and projections of it into the unknown future. There are two extreme ways of thinking about the future. The unknown terrain can be explored either through thought experiments, an exploratory process, which asks where particular trends or events may lead. Alternatively, visions of desirable future states of society can be created and routes to them postulated, without knowing all the detail steps of how they will be achieved: this is colloquially known as a 'normative' approach.

Clearly, map making involves a mix of both exploratory and normative ways of thinking, embarking on sampling an unknown terrain by all available means (and these means have evolved considerably in recent years). By analogy, the thought experiments involved in mapping the unknown terrain of a future society need to use many different tools. Since societies are always far from equilibrium, a property of their complexity that gives societies emergent properties, the foresight processes used need to be able to cope with social dynamism, to see that a KS is not a static utopia that will be 'achieved' at a particular point in time.

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<sup>13</sup> Lipinski, A. J. & Loveridge, D. 'Institute for the Futures Study of the UK 1978-95,' *Futures*, 14, 3, 1982

Just as the map maker would need to bear in mind that one explorer is particularly interested in wildlife, another may deviate from the planned route when seeing something spectacular, and yet another may be given to exaggeration or understatement, so it is for foresight studies. Readers of their outcome will need to remember that in any project of this kind the outcomes are idiosyncratic to the individuals involved in its conduct. Where it has been possible to sample a reasonable range of expertise some of these idiosyncrasies may be ironed out and some points of agreement found. Often this will be useful, but sometimes it may be the idiosyncratic dissent that carries the higher information content. People may possess specific knowledge that quite reasonably leads them to a particular conclusion: they may have subjected a cosy consensus to searching criticism. As a result they may be better informed about what policy levers are available and can be invoked. With these comments in mind, what Euforia hopefully can do is to illuminate important dynamics and dilemmas associated with a KS, to a greater degree than previously possible. It should be able to reveal issues of interest to its sponsor and to the wider community with their interests in the Lisbon Council declarations. By so doing, it should demonstrate the effectiveness of the foresight process in revealing such issues in a useful and timely fashion.

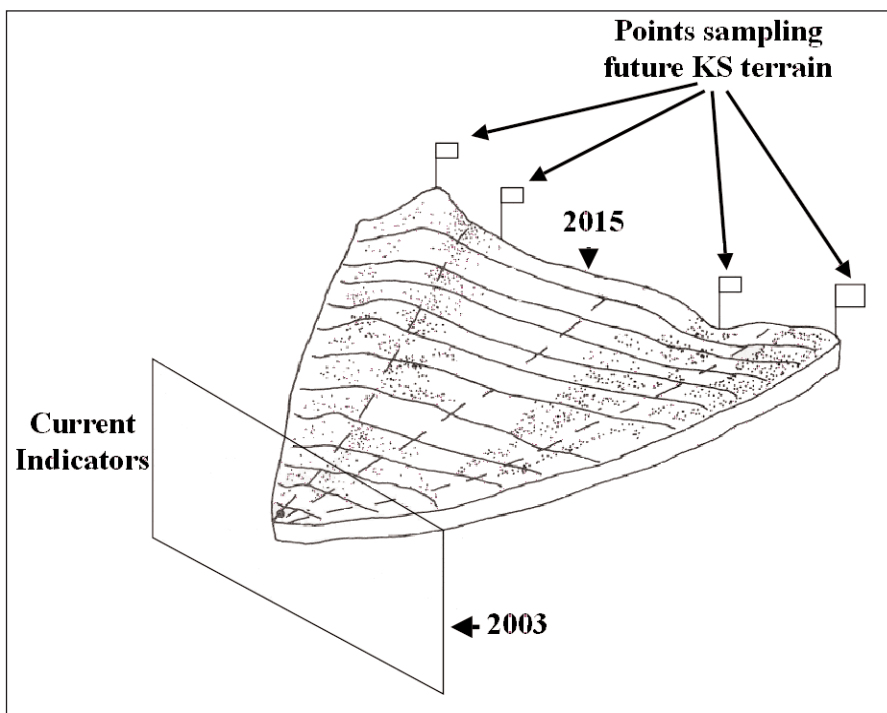
An important aspect of the Euforia project was to test the application of foresight processes to the study of the emergence of a KS. Consequently, the effectiveness of the methods that were selected is an important outcome. The tools chosen had to provide ways of probing the nature and extent of the unknown territory of a future KS by eliciting opinions to questions believed to be reasonable, relevant and robust for that purpose. Clarity of purpose was more important than simplicity. As in all map making the fewer the number of surveying points the poorer the quality of the map and the more dangers there are for the traveller into the unknown territory. However, surveying is also subject to the law of diminishing returns. Similarly, too few perspectives lead to too narrow an appreciation of the nature of the unknown territory of the future. It is rather like denying a map-maker the right to use all possible tools, from simple measuring devices to GPS systems, in making a map of unknown terrain.

For all the above reasons the Euforia project did not attempt to define a KS. In this pilot study, only limited sampling of the terrain of a future KS was possible. Consequently, the insights gained are far from being the whole picture: they are rather like a series of travellers' reports about a new continent, without a comprehensive aerial view or ecological analysis of the whole. Figure 4.1 is an indicative picture of these sampling issues. In the Euforia project the foresight process itself determined the sampling points, while the projects resources determined the density of them.

Some of the sampling points will be examined in the following chapters.



Figure 4.1: Sampling the terrain of a future KS



## Indicators of an emerging KS

This chapter focuses on the account that elements of Euforia provide for us about the European Union and the knowledge society - about variety within the EU, and about how the EU compares to other regions (especially the US). It presents baseline information on KS developments from the indicators study.

### Indicator analysis

The results of the indicator analyses are summarised by the experts responsible for this part of the study as showing that *'the knowledge society has arrived in Europe - but not everywhere and not for everyone.'*<sup>14</sup> There are rapid developments reflected in many KS indicators, especially those concerning IT uptake and use. Whether this is enough to meet the Lisbon Objectives is another matter. In terms of competition and innovation, the benchmarking shows Europe to lag behind the US in terms of IT use and some other currently perceived prerequisites of a KS.

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<sup>14</sup> See the indicator report appended to this document, Empirica's *Knowledge Society Advancement Indicators Report*, from which this quotation is taken. The figures reproduced below all come from this report or presentations made in the course of the project, but where possible the original published source is cited, which typically contains further documentation and discussion.

A few examples to illustrate these disparities:<sup>15</sup>

- within both the EU and the US the development of the Internet is a well-known phenomenon; 54% of the EU population have used the Internet, which seems impressive - but falls well below the 77% of the US population who have done so. (cf Figure 5.1)<sup>16</sup>;
- home-based telework is not common anywhere (unlike some other forms of 'e-work', but the EU's 7% of workers from the EU fitting within a definition of this activity is again below the 17% of comparable US workers. (cf Figure 5.2, which uses a broader definition of telework);
- online searching for health-related information is still a minority activity in Europe, with 36.4% of Internet users (19.8% of the general population) doing so; no EU country reached US levels - more than half (58.3%) of Internet users (44.9% of the US population overall). (cf Figure 5.3 - which also carries information indicative of the need to use foreign languages - especially English - to access many online resources);
- the share of the labour force using e-learning is on average 15% in the EU as compared to 23% in the US. (cf Figure 5.4);
- R&D expenditures are a smaller share of national economic activity (GDP) in Europe as a whole than the US, though a number of EU countries are above or close to the US figure. (cf Figure 5.5).

These are simply a few of the large number of indicators deployed in the study. The selection here focuses not on indicators of prerequisites for the development of the KS - e.g. infrastructure development - but outcomes, such as use of new facilities in work, health care, etc.

IT use is partly a matter of time - the late-comers can rapidly adopt the new technologies. But this does not necessarily enable them to be at the forefront of effective, let alone innovative, use; and new ITs may well be continually introduced to the advantage of the forerunners. The EU as a whole appears to lag in various other indicators, to do especially with productivity, innovation and R&D. Indeed, it was such issues that the Lisbon Strategy was adopted to confront. However, the EU has a series of advantages that may offset this, which will be discussed later. And there are several indicators of IT use in which the leading Northern European countries outperform the US.

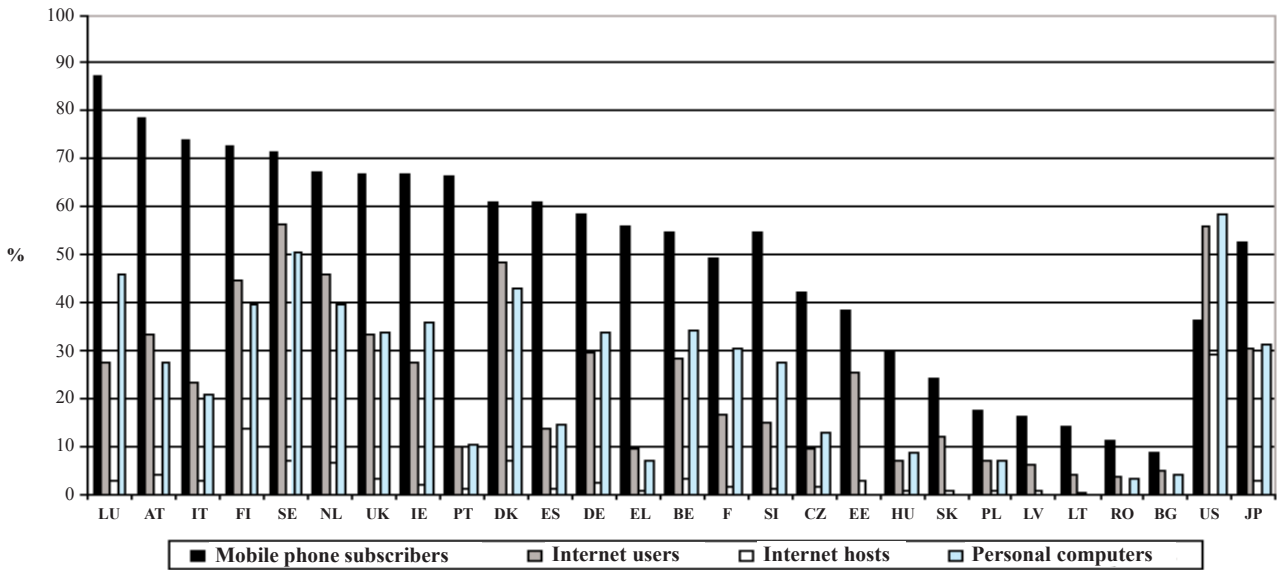
The EU accession countries already compare well with the EU 15 with respect to traditional education measures. But when it comes to IT diffusion, vocational training and some other KS indicators, huge gaps can be found. To facilitate a fast convergence in these countries, those positive trends that are detectable, good computer availability at schools or the well-regarded training systems in some of these countries, need to be sustained. Increased knowledge and human capital transfer (e.g. by means of multinational workshops and training, visiting professors and, professional business partnerships) could also improve education, research and innovation.

Detailed comparisons between the three pilot countries in terms of indicators will be addressed in a later chapter.

<sup>15</sup> As well as featuring in the indicators report, these are drawn from, and discussed in the 2003 SIBIS report *Matching up to the Information Society. An evaluation of the EU, the EU Accession Countries, Switzerland and the United States*, Deliverable 5.2.2 & Deliverable 5.2.3, RAND Europe; available at [http://www.sibis-eu.org/sibis/files/SIBIS\\_Synthesis-Report.pdf](http://www.sibis-eu.org/sibis/files/SIBIS_Synthesis-Report.pdf)

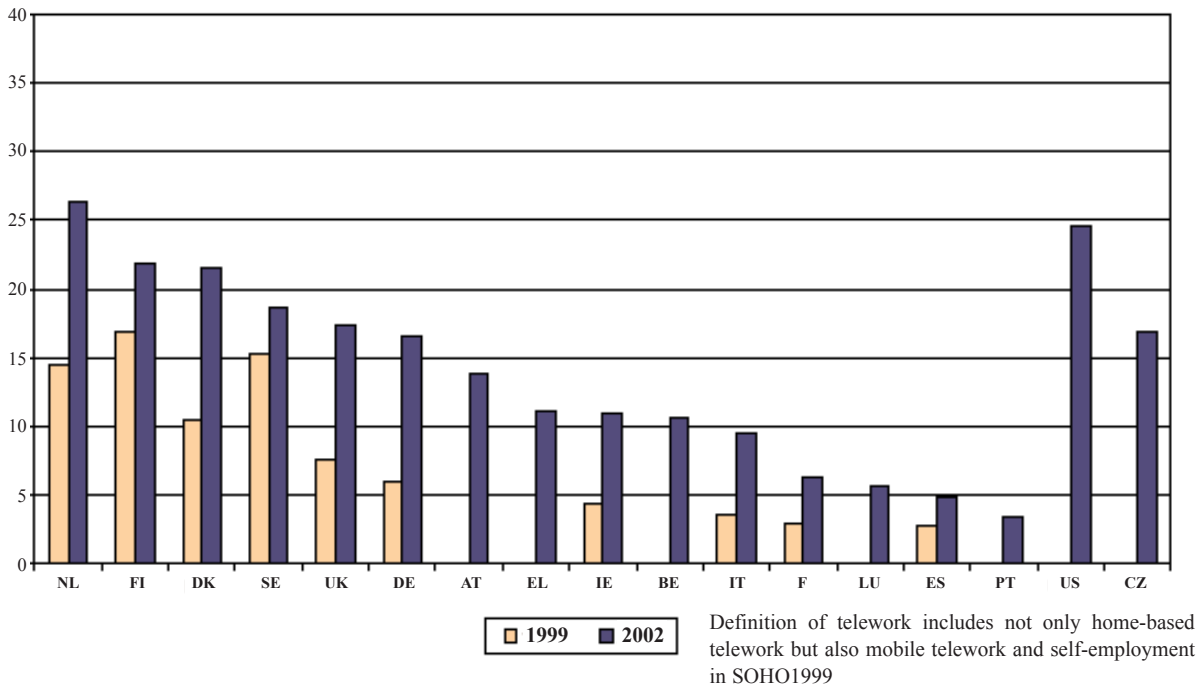
<sup>16</sup> This set of figures is drawn from Empirica's *Knowledge Society Advancement Indicators Report*

Figure 5.1: ICT & Internet Access Indicators (2000)



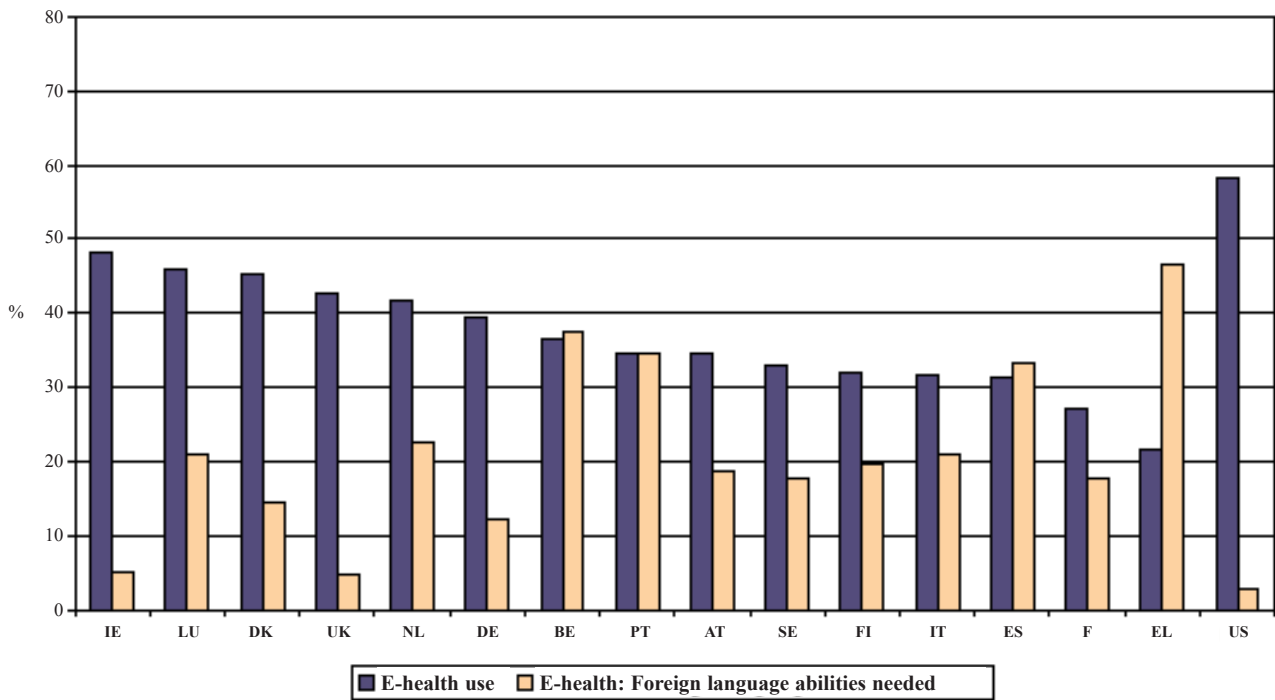
Source: EUROSTAT

Figure 5.2: Spread of telework - all types (1999/2000)



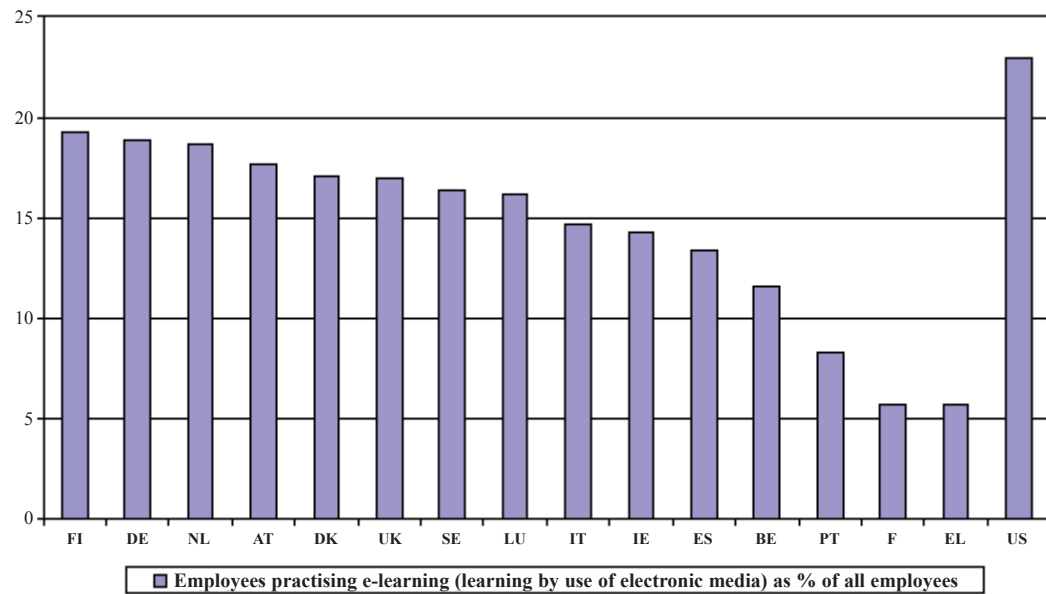
Source: SIBIS 2002

Figure 5.3: E-health use and the language barrier of internet users (2002)



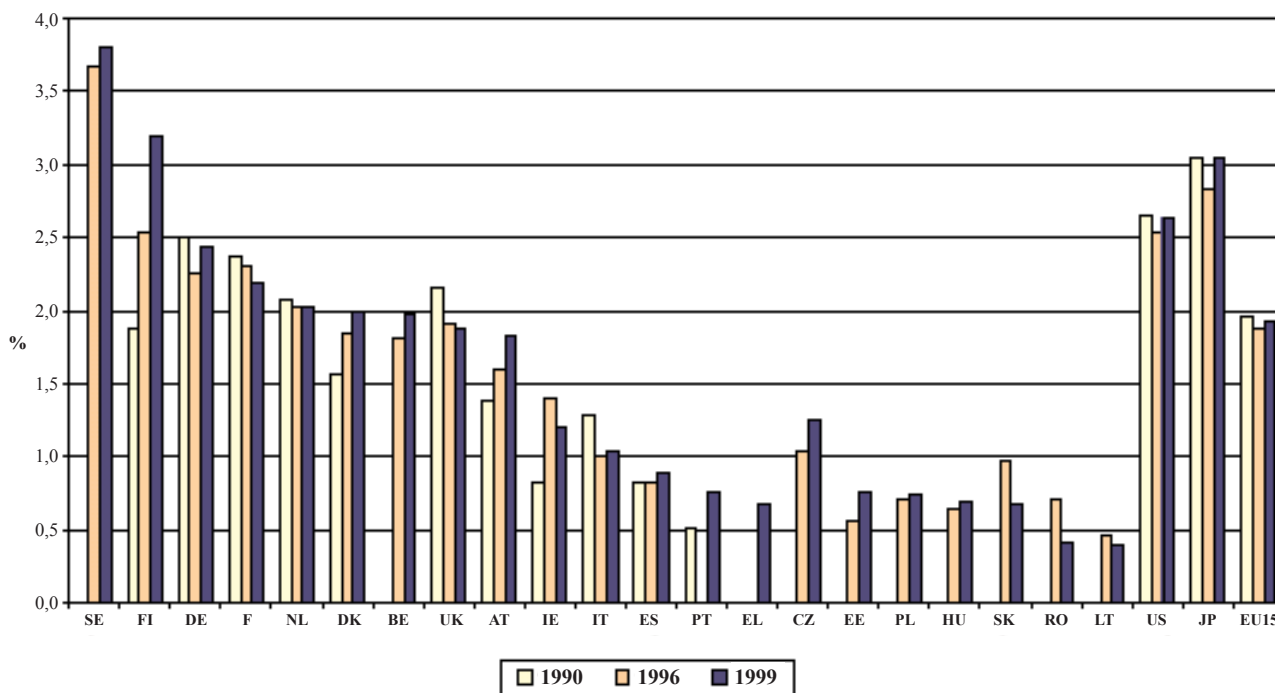
Source: SIBIS 2002

Figure 5.4: E-learning (2002)



Source: SIBIS 2002

Figure 5.5: Expenditure on R&D as % of GDP (1990-1999)



Source: EUROSTAT

### Differences across EU countries

The EU has considerable internal variety. A strong north/south divide can still be observed with the Nordic countries and the Netherlands leading on nearly all of the current selection of KS indicators - again, especially those concerning IT uptake and use. There are parallels here with economic differences between the countries. The southern countries, Portugal, Greece, Spain and (to some extent) Italy, and France lag behind other countries.

The north-south divide is particularly marked in the case of the use of the Internet. Here France's apparently lagging performance may well be offset by the high levels of use of the 'earlier' Minitel technology for computer-communications. The question is how far this is a divide based on access (financial and technical), and how far it is based upon different levels of technical knowledge and capability in the population. Or are there other cultural factors at work - as might be seen from the high uptake of mobile telephony for interpersonal communications in Southern Europe? Both types of factor appear to be playing a role; and this makes it likely that what the future has in store will not be a simple matter of the South 'catching up', as would be expected to follow from increased income levels and infrastructural availability. It is quite likely that there will be distinctive patterns of use of new communications facilities across different countries (and social groups). This should not come as such a surprise - we have only to look at car use and cuisine, at TV viewing and teaching methods, to see that many differences persist across Europe in respect of well-established technologies. Why should new ones be any different - even if they are emerging in an era of greater global communications?

Another important area of KS development is flexible working. Here there may be significant implications for the functioning of European economies, if new forms of work facilitate more flexible forms of business organisation. While home-based teleworking has been relatively slow to take off, multi-location work is expanding rapidly. In this case, Southern Europe and those countries with strict labour regulations appear to be lagging behind. The influences of this are more likely to be on competitiveness and work-life balance more than directly on employment creation.

There are two classes of indicators to which the Empirica team has paid particular attention. Those allow an examination of flexible working and digital literacy in some detail.

### **The adaptability of work arrangements**

Flexibility of working conditions is often a prerequisite for innovation, and might be seen as a key feature of a KS. However, the term flexibility is used in different ways, and here Empirica distinguish between worker-centred and company-centred flexibility. A number of key indicators were identified for each of these categories, through consensus-building involving experts and policy-makers in the EU and Member States.<sup>17</sup>

Table 5.1 presents the results of analysis using these indicators. Figure 5.6 draws attention to points of convergence and divergence between the two indices.

A divergence between worker-centred and company-centred labour market flexibility is apparent, reflecting variations in the economic and labour market policies of EU Member States. One group of countries, such as the UK and Ireland, get a higher score on the company-centred index than on the worker-centred index. Flexibility on labour markets seems to benefit especially employers. In countries like Austria, Italy and Luxembourg, flexibility on labour markets seems more oriented to workers. The Nordic countries and the Netherlands stand out as scoring high in both indices. These Member States seem to come closest to reaching the aims of the European Employment Policy. At the other end of the ranking order, Spain, Greece and Portugal still seem to have a long way to go before they reach at least EU average levels of labour market flexibility and adaptability.

Finding a balance between these two types of arrangement is liable to be a major challenge in the EU in coming years. The work-life balance is already a subject of some concern, as is underlined by some further results of Euforia discussed below, while competitiveness and innovation may require more flexible regulatory environments. Self-directed and company-provided training will need to be enhanced to create more knowledgeable, as well as more flexible, workers.

### **Digital literacy**

In a KS, much information and communication with individuals and institutions is mediated through digital systems. The ability to operate in a responsible and critical way on the Internet is liable to be essential for taking part in the societal processes of living, working and learning. (Increasingly so as, in electronic commerce and other aspects of digital access to information and services, grow in popularity.)

Not surprisingly, further aspects of the digital divide emerge here too. The project used the COQS index, developed in the SIBIS project - illustrative results are displayed in Figure 5.7.<sup>18</sup> To be digitally literate is indicated by the ability to use the Internet for:

- communicating with others, including the ability to use e-mail and chat rooms as well as to create a personal web page;
- obtaining (or downloading) and installing software on a computer, covering installation of new software as well as of supplemental packages to existing programmes (updates, bug fixes etc.);
- questioning information search on the Internet, operationalised as confidence in identifying the source of information on the Internet;
- searching for the required information or confidence in using a search engine to find information.

<sup>17</sup> The discussion and source of material used here is Empirica *KS Advancement Indicators Report*, 2003, and K. Gareis and W.B. Korte, (2002), 'ICTs and the Adaptability of Work Arrangements in the EU', in: Wrycza, S. (ed) *ECIS 2002 - Information Systems and the Future of the Digital Economy. Proceedings of the 10th European Conference on Information Systems, Gdansk, Poland, 6th-8th June 2002*, pp 1101-1112, Gdansk: Wydawnictwo Uniwersytetu Gdanskiego

<sup>18</sup> Source: SIBIS Topic Report no. 4: *Education*, 2003

The national index of digital literacy COQS gives equal weighting to these four elements of digital literacy - it is the average of the four indicators, weighted equally against each other.

According to the COQS data, the level of digital literacy in the EU as a whole remains low. There are marked gender and age gaps (women only reach 62 % of the average digital literacy of EU men; young people score notably higher than adults.) There are also large differences in the level of digital literacy between the countries surveyed. Within the EU the top scoring country (Denmark) has a score three times that of the lowest (Portugal). In the EU (featured as a whole in the rightmost pair of columns in Figure 5.7) as well as in the US (the penultimate pair of columns), there is still a way to go towards total digital literacy, which should be an important feature of a KS.

Inequality across different social groups in the context of COQS has been mentioned before and will now be considered more generally.

Table 5.1: Flexible work arrangements in Europe

Dimension	TIME		PLACE		CONTRACT		CONTENT		AWAI-2 Worker-centred Flexibility Index <sup>20</sup>	Country rank
	Voluntary part-time working	Discretion over working time	Home-based teleworking	Teleworkability	Job security	Job tenure	Participation in decision making	Lifelong learning		
Netherlands	100	77	60	99	94	79	100	72	6.63	1
Sweden	44	75	79	76	87	95	88	100	6.13	2
Denmark	46	82	67	73	100	70	98	96	5.88	3
Finland	20	100	100	83	87	83	97	91	5.88	3
Germany	44	82	22	93	88	85	75	24	5.13	5
Italy	13	81	24	100	86	100	67	24	4.63	6
U.K.	59	74	36	92	84	69	86	97	4.50	7
Ireland	39	75	15	75	84	78	76	24	2.50	8
France	33	63	18	85	77	93	80	13	2.38	9
Spain	16	70	19	87	83	83	56	23	2.00	10
COMPANY-CENTRED FLEXIBILITY Indicator	Part-time working	Atypical working hours	Mobile teleworking	Tele-Cooperation	Employment Protection in Legislation	Involuntary temporary workers	Management by Objectives	Employee training provided by company	AWAI-2 Company-centred Flexibility Index <sup>21</sup>	Country rank
U.K.	57	86	49	85	100	14	85	96	6.63	1
Netherlands	100	72	100	90	58	39	96	84	6.63	1
Finland	20	84	60	100	64	37	69	100	6.00	3
Denmark	47	70	49	63	78	14	100	89	5.13	4
Sweden	44	73	53	75	58	37	56	80	4.63	5
Ireland	35	85	7	75	89	6	69	67	4.00	6
France	31	83	19	53	42	43	71	47	3.50	7
Germany	43	75	35	64	49	21	56	56	3.38	8
Spain	16	100	12	48	40	100	67	36	3.00	9
Italy	14	93	33	54	38	21	65	42	2.38	10

<sup>19</sup> Value scores are assigned to the different answers to the question underlying the indicator. For example: Obtain and install digital tools: *very confident* = 3 points, *fairly confident* = 1 point, *not confident, don't understand the question* = 0 points.

<sup>20</sup> Inverse average rank of 8 benchmarked variables

<sup>21</sup> Inverse average rank of 8 benchmarked variables

Figure 5.6: Comparison of two measures of flexibility (Comparison of AWAI worker centred and company-centred subindices 1999/2000)

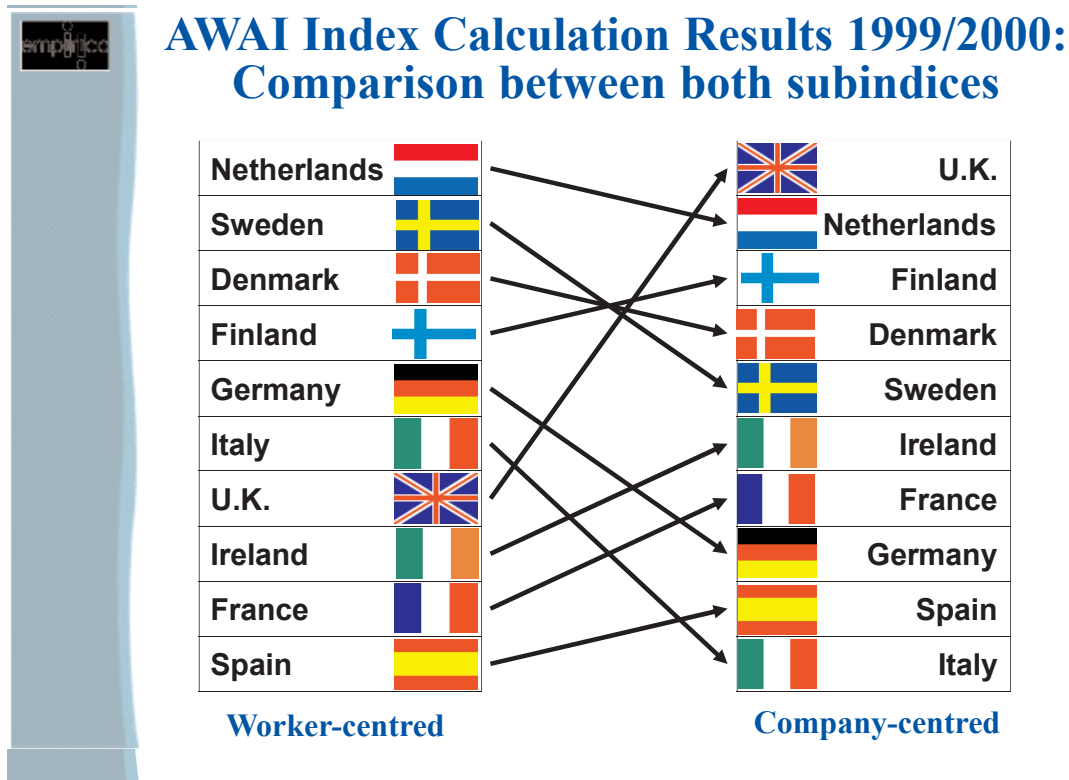
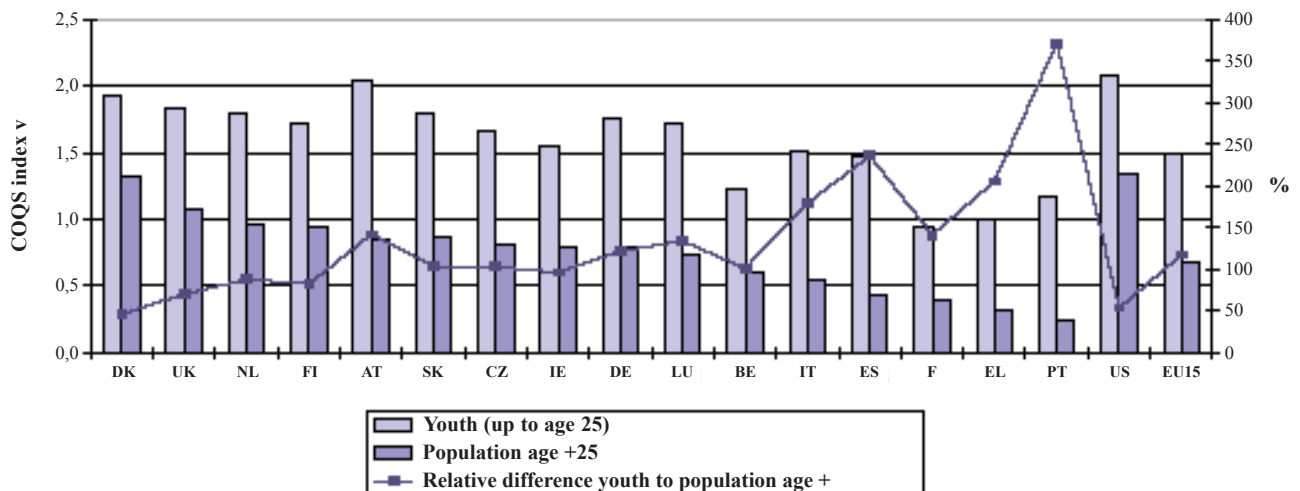


Figure 5.7: COQS data on digital literacy



#### Digital divides - gender, education, age

A major and growing concern is the extent to which people are able to gain access to and are competent in using the services that digital technology is now making available: this is the genesis of the so-called digital divide. The Digital Divide Index (DIDIX) index endeavours to enable quick comparison of the levels of IT access of disadvantaged groups to the population average in EU Member States. DIDIX combines the divides by gender, age, education and income in



relation to computer use, Internet users and Internet use at home. It measures the adoption of IT by potentially deprived societal groups relative to that of the population as a whole.

The four so-called risk groups (potentially deprived social groups) are compared with the population average. The relevant risk groups are:

- gender: some 52% of the EU population in 2000;
- age: people aged 50 years or older ('50+'), ~ 40% of the EU population in 2000;
- education: people who finished formal school education at an age of 15 years or below, ~ 30% of the EU population in 2000;
- income: the lowest quartile of the survey respondents ~ 25% of the EU population in 2000.

For each group, a composite indicator of IT adoption was constructed from the weighted average of data concerning the percentages of computer users (50% of the weight), Internet users (30%), and Internet users at home (20%), drawing on Eurobarometer and SIBIS data. Figure 5.8 below displays data for two points in time for the EU as a whole.

While the overall DIDIX index<sup>22</sup> appears to be fairly stable over time, this masks increasing divides in education and especially in income, set against decreasing ones in gender and especially age terms. This points to areas where policy is best directed.

Country differences point to a strong tendency for these divides to decrease as countries move up the set of KS indicators. An over simplistic conclusion might be that divides are essentially a phenomenon that will be overcome automatically as a KS evolves because:

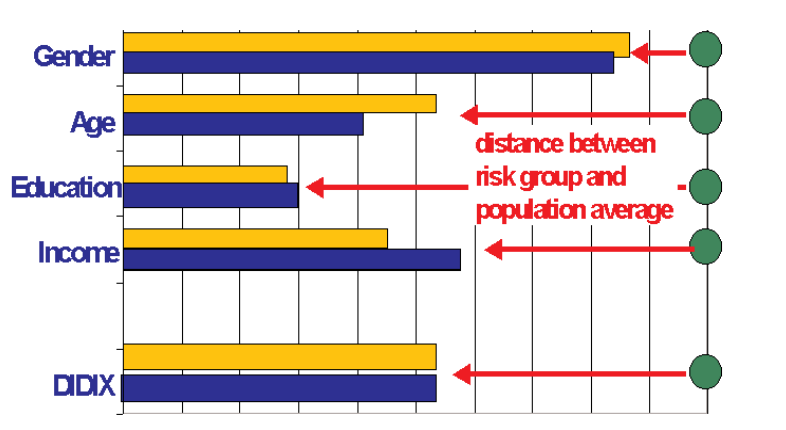
- the more information sensitive countries have made serious political efforts to widen access to IT facilities;
- as a KS continues to evolve, there may well be further developments in IT uses which are again the occasion for new social divides.<sup>23</sup>

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<sup>22</sup> For discussion of DIDIX, see Empirica: KS Advancement Indicators Report, 2003; and Hüsing, T. and Selhofer, H. (2002) 'ICTs and the Adaptability of Work Arrangements in the EU', in: Wrycza, S. (ed) ECIS 2002 - *Information Systems and the Future of the Digital Economy. Proceedings of the 10th European Conference on Information Systems, Gdansk, Poland, 6th-8th June 2002*, pp 1273-1286, Gdansk: Wydawnictwo Uniwersytetu Gdanskiego

<sup>23</sup> While it might be expected that more user-friendly IT systems will be evolved, allowing for wider social participation, it is also likely that many services will be introduced that require payment to be made for use.

Figure 5.8: Digital divide indices for the total EU, 2000 and 2002



The indicators are telling ones, but do not go far into the levels and purposes of utilisation of the IT facilities they deal with - e.g. use of Internet for access to health education. There are liable to be substantial inequalities here too, together with differences in the purposes for which new opportunities are employed, and in the costs and benefits associated with them.

### Indicator analyses and knowledge society foresight

The indicator analyses have impressively demonstrated the scope for examining aspects of a KS through statistical means. The analysis has also suggested ways of conceptualising a KS, for instance in the immediately preceding discussion of digital literacy, that add considerably to the rather more abstract, not to say vague, definitions in so much policy discourse. They evoked considerable debate and comment in the course of workshop presentations, and there were many comments as to the apparently arbitrary nature of the indicators used, and suggestions for new data that might be generated or applied.<sup>24</sup>

The selection of indicators needs to be improved continually, but it should be borne in mind that collection of new primary data is expensive and often difficult. The present selection is largely a matter of the:

- availability of official statistical data that could be applied cross-nationally;
- piggybacking of indicators work for Euforia on activities already underway in SIBIS and elsewhere;
- development of an indicator framework to provide guidance in search for data.

The choice of indicators is certainly limited by the lack of qualitative data, a situation that the Euforia project aimed to complement with qualitative information for the three pilot countries, as can be seen in other parts of the study.

<sup>24</sup> To avoid introducing yet another layer of analysis and detail we have not even drawn upon another line of indicator work being developed by the FFRC, and presented at Euforia workshops. This work, some of which is published as Ahokas, I & Kaivo-oja, J (2003) "Benchmarking European Information Society Developments" in *Foresight, The Journal of Futures Studies, Strategic Thinking and Policy*, Volume 5, No. 1, 44-5, develops a system of indicators of motivation, access and skills for the information society. Aggregated indicators based on these statistics, for EU countries, are shown to correlate highly with independent judgements of national competitiveness (the Current Competitiveness Index).

The interpretation of indicators in relation to the EU's goals, particularly following the Lisbon Council, remained a very lively issue in national and cross-national workshops. The data do not present information on long-term trends - such information is rarely available for new indicators. So it is not possible to extrapolate trends and estimate when or whether the EU would catch up with the US in terms of these indicators.

But large gulfs are sufficiently often encountered between the EU and US that questions must be raised about the scale of change that would be required for the ongoing advance of a KS in Europe - especially if the US itself continues to pursue innovation- and competitiveness-oriented strategies. This must raise doubts about the EU's capability to become the world's most dynamic and competitive KS by 2010. However, some EU countries are outstanding in terms of many of the KS indicators, which demonstrates - among other things - that it cannot simply be a matter of European attitudes, social protection regimes, and the like that is behind the transatlantic gulf. Furthermore, there are strengths in the European regulatory and cultural systems that may be particularly appropriate for the fostering of KS in its wider sense - i.e. beyond the 'information society' development and application of IT.

The relative underperformance of the EU as compared to the US on a number of KS indicators has been noted. But these do not tell the whole story. The ability of the EU 15's population for thinking and acting critically, independently and responsibly, its cultural variety together with tolerance and a well developed social sense may result in a better working environment and innovation which, in the end, is likely to be turned into a competitive advantage. Up to a point this is already reflected by trends in labour productivity and patent applications.

Among the prerequisites for a KS, the education sector plays the most important role, as the Lisbon Council has already suggested. The development of human capital will continue to be central to the KS. In consequence, it is suggested that special attention should be directed to:

- **IT provision and education:** IT lessons and ready access to IT for pupils in schools and at other public locations, at any time, to free IT literacy from social and income constraints;
- **English as a language:** At present the Web is largely based on English, and if another language overtakes this it is unlikely to be a European one. A good command of the English language has become indispensable to obtaining access to the wealth of information available online. It is also more often than not necessary for international communications in a globalised world;
- **pupil/teacher ratio:** A small number of pupils per teacher can be seen as one indicator of effective learning to facilitate the formation and development of individuals' human and social skills. Such skills increasingly become an important prerequisite for participation in a KS. Further factors to do with the structure of the education system in general, are also relevant to the active participation of a maximum of European citizens in the KS. The development of skills in critical and logical thinking, and the ability to take responsibility is essential;
- **flexibility, sense of responsibility and self-management:** Building on the previous bullet point, a knowledgeable citizenry needs the ability to undertake self-directed learning, independent job search, and be adaptable to flexibility in all spheres of life. For employees (and the self-employed), such capabilities should form the basis for employment, wealth and well-being, through fostering digital literacy, global team working, flexibility and the like;
- **companies** and other organisations need to be open to innovation. This includes the willingness and readiness to practise new forms of working including the different forms of teleworking and mobile working, enabling workers to undertake lifelong learning and to take more responsibility for their work. Where rigid regulations are impeding such flexibility, as is believed to be the case in quite a few EU Member States, these need to be revised.

- **governments** can further improve innovation ability by strongly investing in R&D and other innovative activities, pushing technological advances and other innovations forward faster, and in appropriate directions (e.g. toward sustainability). There are shining examples of successful Member States in this area - but some European countries lag behind here too.

## Views from workshops

The workshops contributed in significant ways to deepening the analysis of a KS, adding qualitative depth to the quantitative indicators, suggesting topics and issues that have not so far been covered in indicator analyses, and casting light on different national paths to KS. They are clearly important parts of any foresight process, and despite advances in IT systems there is limited scope for replacing them at present by electronic communications. The intensity of dialogue simply cannot be achieved on a regular basis without face-to-face interaction.

### The cross-national workshop

A cross-national workshop was held in Brussels early in the project's life.<sup>25</sup> This demonstrated that bringing together expert groups to discuss KS developments can provide useful insights into the key issues and processes here. Many different sorts of workshop could be conceived. The workshop took place during and after these presentations. It was intended to:

- provide cross-national perspectives on the topics that Euforia was to take up from a national basis in three countries - to raise issues for these national studies, to act as a sounding board;
- introduce participants (some of whom were to be involved in the national activities) to the sorts of method used in foresight studies, and thus to exemplify issues outlined in the handbook - in other words to act as a demonstrator of KS foresight methods and thinking;
- explore the sorts of problems and considerations that need to be taken into account in applying foresight methods to the knowledge society concerns of the European Foundation - to be a prototype.

The workshop followed the type of linear pattern described in Figure 2.1, with participants first considering factors that would shape the development of a European KS, and finally going on to examine influences on living and working conditions and industrial relations.

<sup>25</sup> A detailed account of the conference, and summary of presentations, is provided in T. Kauppinen (2002) *European Knowledge Society Foresight - the Missing Link between Technology Foresight and the Lisbon Objective?* Dublin, Foundation Conference Report (mimeo). The workshop methods on which the present synthesis draws are described in chapter 12 of that report, by I. Miles and R. Popper: 'Important Trends, Drivers and Impacts of the Knowledge Society: The Euforia Cross-National Workshop Results'.

### *Drivers of the KS*

The factors that the workshop prioritised in terms of their role in driving and shaping the KS in the EU were the following (top 15). These have been grouped into major categories, although there is inevitably some overlap (which has resulted in some items being put close to other categories they may fall into):

#### Issues related to **demographic change**:

- challenges for social security and public health care;
- growing heterogeneity in family forms;
- increasing ageing society intensified especially by EU enlargement.

#### **Governance**, the state and the EU:

- enlargement of EU to 25+ and even more;
- evolution of democracy in an e-government environment;
- globalisation: development of global governance and emergence of local interests increases complexity of interactions.

#### **Environment**-related topics:

- changing political priorities, e.g. sustainability;
- growing importance of environmental education;
- increasing rate of climate change and global warming.

#### **New technology** and related topics:

- continuing increases in all aspects of ICT performance (e.g. wireless connectivity, storage, size);
- widespread development and diffusion of new methods for producing, locating, sharing and managing knowledge for individuals and organisations;
- wide application of new technologies in public services with wide implications - for health, education (but also privacy concerns);
- decreasing confidence of (e-) transactions and data protection;
- more demand for low skill services but decreasing supply.

#### **Cultural change**:

- increasing degree of artificial environment - preference to spend leisure time in e.g. theme parks, virtual reality entertainment, etc. rather than natural environments.

These factors are wide-ranging ones, each of which could deserve detailed study in its own right. Some of them are arguably more like features of KS (in the terminology of Figure 2.1) than drivers - and some even seem to imply feedback from 'impacts' onto drivers (e.g. concerns about e-security). While participants in the workshop were happy to seek to identify drivers of KS, there was actually some debate about whether this was an artificial category.

The KS is seen as being shaped by many factors. Technological development is one, but far from the only one. And this is not just a matter of the (important) ongoing evolution of Information Technology (IT) power. It is also to do with user confidence in network security, the ways in which public services and government are informatised, the use of knowledge management systems, and the bewitching influence of artificial environments (to summarise a complex set of points). In other words, the information society elements of the KS are very much an interaction between technological capabilities and social responses. A second set of factors that are seen as important determinants of the features of a KS are the socio-economic issues connected with demographics (ageing, reduced supply of low skill workers), and changing family structures. A third group of issues concerns challenges to government and governance associated with issues of environment and sustainability, globalisation (and countervailing localisation developments) and EU enlargement.

The discussion of the European KS clearly led participants to address a wider range of issues than those usually highlighted in analyses of the knowledge-based economy. In practice, KS is taken to be a wider concept than the narrow knowledge-based economy.

### *Impacts of the KS*

The workshop addressed the question of what major features of living and working conditions and industrial relations were seen as being affected by these factors in important ways. Some of the implications addressed related to

demographic and family changes...

- ageing workforce is increasingly unsuited to long hours;
- emergence of new forms of childcare and care for elderly;

...Other developments focused on problems associated with working life...

- uncertainty and constraints in the workplace create more stress and associated health problems;
- work pressure increasingly strains work-life balance;

...Reflecting such workplace developments as...

- divergent trends to more individual contracts and neo-Taylorist working conditions;
- increased levels of (cyber) security by firms creates increased surveillance of employees;
- more multi-location work;

...Resulting in efforts to manage change...

- trade unions become more innovative in recruiting and retaining various segments of the workforce (e.g. temporary/contract workers);

...But quite possibly with continuing social exclusion and tension:

- emergence of a two-tier society sees the wealthy move to private service provision, whilst public services for the poor become poor services;
- take-up of unskilled jobs by economic migrants leads to friction between native and foreign workers.

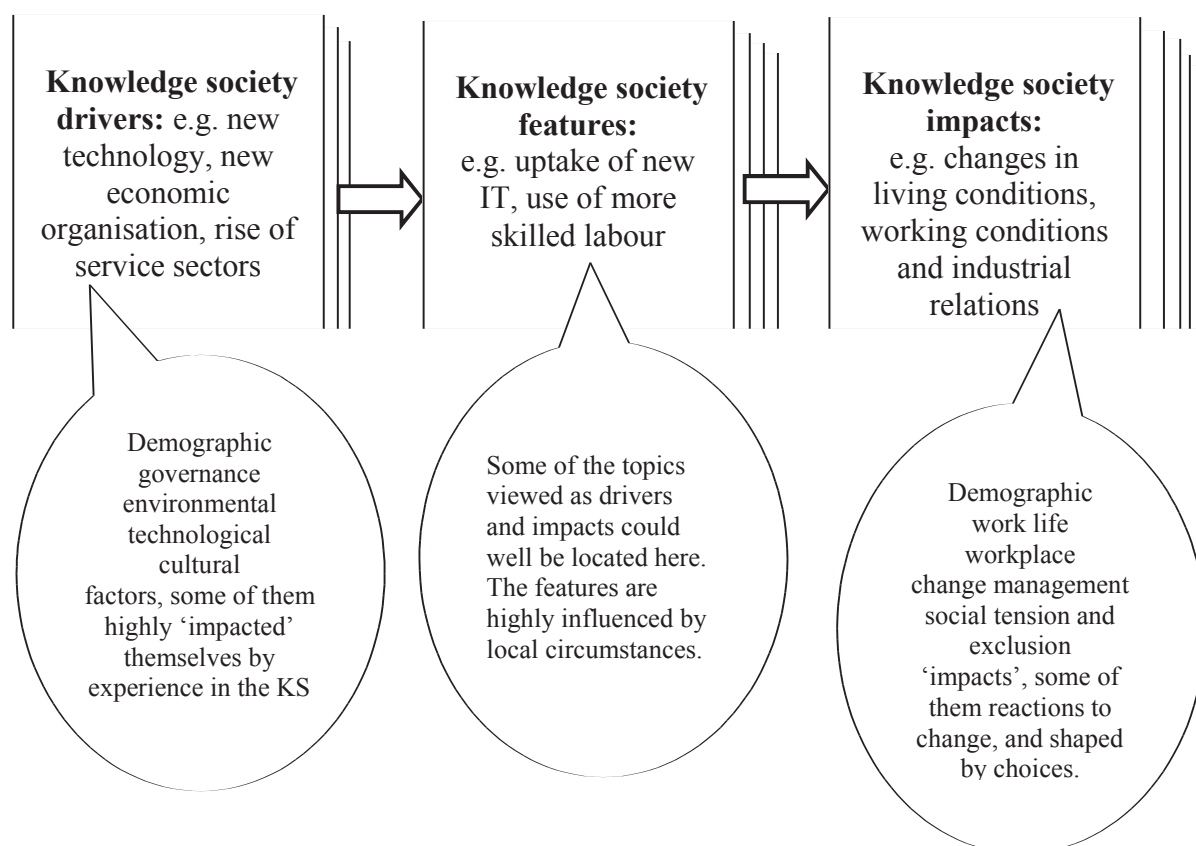
Again, these factors are wide-ranging ones. (As with the previous list, they were chosen as the most salient of a much longer list of topics generated by break-out groups.) One striking feature is that so many of the work-related items are expressed in negative terms, are suggestive of undesirable developments such as pressured work-life balances, workplace surveillance, stress at work; multi-location work is less clearly seen in evaluative terms, and individual contracts and neo-Taylorism may not be seen as completely unwelcome (at least, not the first element). Demographics are again mentioned, in connection with working hours. Social cohesion/exclusion issues are raised in terms of a two-tier society, conflict between native and foreign workers. More positive social innovations also get a look in: new forms of child- and eldercare, innovative trade unions. An interesting result of the workshop was that there was a strong expectation that the 'drivers' would tend to promote these 'impacts'. When we engaged in what was termed a cross-influence analysis, there was a preponderance of positive influences from the former to the latter, as opposed to the negative influences that could quite possibly also have been elicited from the workshop. (Note that 'positive' and 'negative' here refer to arithmetic relations of plus and minus, rather than normative assessments of desirable and undesirable.)

The picture of the potential KS emerging from the workshop is a very mixed one. What is apparent is that the participants were concerned that many of the features of the KS in terms of living and working conditions and industrial relations were by no means reassuring. Various more or less alarming developments were seen as being at the very least as worthy of serious attention - and whether such issues are integral or more malleable features of the KS is a topic that would be good to examine in future workshops. Figure 6.1 summarises these key points.

#### *The cross-national workshop and knowledge society foresight*

The workshop described here took place in the context of a conference and combined elements of demonstration of foresight methods with an effort to obtain results to use in Euforia. The presentations at the conference did a good job in raising issues in their own right and helping to tune participants into some major themes of a KS. Effectively these presentations provided participants with a common knowledge base (e.g. around indicators and the goals of foresight). It is good practice for participants in scenario and other foresight workshops to be informed in advance by means of a series of background papers and the like. The presentations substituted for this. But the combination of conference and workshop was one that puzzled participants somewhat.

Figure 6.1: Some points highlighted by the cross-national workshop



The participants contributed in a lively and creative way and suggested that the picture of KS is rather more complex than the linear model of Figure 2.1, though this proved a useful tool for organising the workshop activities. The workshop drew attention to numerous significant aspects of the KS, how European experience is liable to be shaped by governance and socio-cultural and demographic change, as well as by techno-economic factors alone. It indicated how various rather alarming developments in living and working conditions are possible - and identified the need for social and institutional innovations.

Pointers from this process for analysis of the KS include the following:

A KS is seen as being shaped by technological development. This is not just a matter of the important, ongoing evolution of IT power, but also has to do with:

- user confidence in network security;
- the ways in which public services and government are information sensitive;
- the use of knowledge management systems;
- the bewitching influence of artificial environments (to summarise a complex set of points);
- socio-economic problems connected with demographics (ageing, reduced supply of low skill workers) and changing family structures;
- other challenges to government and governance, associated with issues of environment and sustainability, globalisation and countervailing localisation developments and EU enlargement.



The discussion of a European KS led participants to address a wider range of issues than those usually highlighted in analyses of the knowledge-based economy. They recognise that KS is a wider concept - and a more multifaceted reality is hypothesised - than that usually encompassed in arguments about the knowledge-based economy.

It would be valuable not only to repeat this kind of exercise at regular intervals, but also to ensure that it be extended to cover (or even focus on) accession countries. As suggested earlier, workshops could also be designed so as to focus more on diversity of experiences and trends within the EU and the nature of different European KS.

The bottom line from these workshop results is that the emergence of a KS should by no means be taken to imply the automatic alleviations of the sort of problems which the Foundation was established to deal with. Certain problems may well be intensified, and Euforia has shown that foresight approaches can help identify some of those that are on the horizon, and explicate some of the dynamics behind these developments.

### **National workshops**

The national workshops and their contribution to analyses of the KS in the three pilot countries are discussed in more detail further on in the report. These workshops also contribute to thinking about the European KS more generally, but since the conclusions are largely in line with those discussed above - while stressing the diverse varieties of KS that could emerge - they will be discussed later. At this point it should be stressed that national and regional workshops can contribute to European KS analysis, always providing that appropriate participants are selected.

### **Views from the Delphi study**

Foresight is a powerful approach for gaining insights into a KS, and Delphi, as one of the most widely used tools for eliciting knowledge-based inputs from a wide population, can be an important part of that approach. In the Euforia project the Delphi was used to directly address questions of KS development through a questionnaire with some 32 topics to see which of them the respondents thought most likely to characterise an EU KS in 2015.

These topics were derived from national workshops and other consultations in the course of the project. The study went through two rounds and elicited responses from the three pilot countries (fewer German respondents than had been hoped for, however) as well as other international inputs. This chapter will focus on overall results, and in a later chapter we will examine material specifically relating to the three pilot countries.

### **Knowledge society topics**

Table 7.1 lists those statements where there is a clear majority indicating that it is 'about right' as a characterisation of 2015.

Many of these topics accord closely with Lisbon objectives. Increased application of IT; orientation of innovation toward sustainability; lifelong learning; new forms of work and networked organisations are all explicit or implicit in these declarations. A few topics are more ambiguous, especially those concerning workplace stress and work-life balance. It will be noted that these are a minority of topics - for others where there is considerable disagreement, sometimes because of different expectations in different countries, or they are felt to 'overstate' the situation in 2015 (Table 7.2).

Notably, many of these topics concern workplace, employment and industrial relations issues. The results reflect scepticism that institutional arrangements will be adapted in what are widely seen to be appropriate ways - that trade unions will be able to develop better strategies and achieve political influence; that network and learning organisations will be the norm; that ethical practices will prevail at the workplace; and that social inequalities will be seriously tackled. Neither unions nor employers, neither professionals nor policymakers are expected to meet the challenges of KS

adequately, to put it bluntly. If the previous set of topics demonstrate that a KS is on the way, this set underlines the point that this is not utopia.

Table 7.1: *Likely features of the KS in 2015*

No.	Theme	Topic statement
02	Governance & mobility	Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country.
06	Governance & mobility	EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations.
09	Health & privacy	Widespread use of telemedicine and online health monitoring systems increases the ability of people with serious chronic and age related diseases to maintain their independence.
12	Industrial relations	New forms of networked business organisation that were unknown or very rare at the turn of the century will now account for a substantial level of economic activity in my country.
13	Industrial relations	A major increase occurs in my country in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work.
18	Living conditions	Harmonisation of educational standards (including certification) across the EU increases trust and transparency in my country's educational system.
20	Living conditions	Lifelong learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life.
21	Living conditions	Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict.
24	Sustainability & development	Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies.
27	Working conditions	Social and policy changes in my country encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities.
30	Working conditions	Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to.

Table 7.2: *Delphi topics that were generally seen as overstating the KS in 2015*

No.	Theme	Topic statement
03	Governance & mobility	Labour relations organisations (e.g. trade unions and other representative bodies) will have a major influence on government and business in shaping the knowledge society in my country.
15	Industrial relations	Trade unions have become more important in my country, responding to new work arrangements, offering networked membership, new types of social security and other services to their members.
16	Industrial relations	Large organisations in my country have widely introduced new, innovative and systematic models for employee participation in decision-making relating to working practices and capital investment.
17	Living conditions	A practical emphasis on ethics, justice and equity increases in working life, and strongly influences the development of business and conduct of professions in my country.
22	Sustainability & development	The widespread use of e-commerce removes obstacles to accessing products, services and employment in the peripheral regions in my country, increasing their competitiveness and stemming depopulation.
26	Sustainability & development	EU enlargement shifts economic resources towards accession and possible pre-accession countries, diminishing disposable income in the EU15 and creating the conditions for persistent unemployment of at least 10% across the EU15.
31	Working conditions	New organisational procedures and systems that turn firms and other organisations into 'learning organisations' have been widely adopted, and not just by a small vanguard, in my country.

### **Living and working conditions, industrial relations**

There is a vast amount of data that can be examined in numerous ways. Table 7.3 presents one simple set of results. It takes the influences of the set of topic statements that were felt to be 'just about right' in characterising a KS in 2015. The influence on each of the nine features of living and working conditions and industrial relations is summarised.

It is striking that many more 'increase' influences are noted than 'decrease.' Furthermore, the feature that receives most 'decreases' from KS development is negative in policy terms (social exclusion), while most others are couched in positive terms. The clear conclusion is that most of the KS developments that received strong endorsement in the Delphi survey are ones that are supportive of improvements in living and working conditions and industrial relations.

The information was analysed to see which KS developments are thought likely to have the most influence on the features; and to identify which features are most highly influenced. These are the most outstanding of these relationships:

- Lifelong learning (Statement 20: 'Lifelong learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life'). This was believed to improve all three industrial relations factors (employer-employee relations, economic growth/wealth creation, and entrepreneurship and innovativeness). It is also believed that lifelong learning will improve the employee autonomy and responsibility as well as creating more jobs. There is uncertainty in the type of impact that lifelong learning will have on work-life balance but an expectation that it will improve social cohesion. Effects over social exclusion or divides are also uncertain. Even though a considerable number of participants believe that lifelong learning will improve sustainability and environmental quality, there is still a substantial amount of people thinking that it will have no effect over sustainability.
- Use of environmental technologies (Statement 24: 'Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies'). The use of environmental technologies was believed to strongly improve sustainability and environmental quality in Europe. It was also expected to increase social cohesion, economic growth/wealth and job creation. A considerable number of participants believed that the use of environmental technologies will have no effect over employer-employee relations, employee autonomy and responsibility and work-life balance, but still a few people think that it could either have a reinforcing or inhibiting effect. Ultimately, many participants believed that the use of environmental technologies will decrease social exclusion or divides though some other people think that it will have no effect.

Table 7.3: Delphi topics and their influences

Statements	Influence of trends that are 'about right' by 2015 on LC, IR & WC								
	Living conditions			Industrial relations			Working conditions		
	Social cohesion	Social exclusion or divides	Sustainability / environmental quality	Employer - employee relations	Economic growth / wealth creation	Entrepreneurship and innovativeness	Employee autonomy and responsibility	Work-life balance	Job creation
02	I	??	I	NE	I	I	I?	??	??
06	??	??	??	??	I	I	??	??	I
09	I	??	NE?	NE	I	I	NE	NE?	I
12	??	??	I	??	I	I	I	??	I
13	??	??	I	??	I	I	I	??	I
18	I	D	I?	I?	I	I?	NE?	NE	I
20	I	??	I?	I	I	I	I	??	I
21	D	I	NE	D	D?	??	??	D	NE?
24	I	D?	SI	NE?	I	I	NE?	NE?	I
27	I	D	NE	I	I	I	I?	??	I?
30	I	??	NE	??	I	I?	NE?	??	??

**Key:** SI = strongly increases; I = increases; NE = no effect; D = decreases? = some uncertainty; ?? = very uncertain (bimodal distribution)

**Note:** statements listed in Table 7.1.

- Decrease of gender-related pay inequalities (Statement 27: 'Social and policy changes in my country encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities'). Such policies were seen as a KS trend that will increase all three industrial relations factors (employer-employee relations, economic growth / wealth creation, and entrepreneurship and innovativeness) as well as social cohesion. A great number of participants believed that social and policy changes to reduce gender-related inequalities will represent more employee autonomy and responsibility at work and also create more jobs, but there is also substantial opinion that there will be no effect over those two factors at all. On the other hand, it was agreed that such policies are likely to reduce social exclusion or divides. Finally, further development of this trend was not seen as influencing sustainability and environmental quality.
- New forms of networked business organisation (Statement 12: 'New forms of networked business organisation, that were unknown or very rare at the turn of the century, will now account for a substantial level of economic activity in my country'). The emergence of such new forms of networked business organisations was believed to improve two of the industrial relations factors (economic growth/wealth creation, and entrepreneurship and innovativeness). But there was uncertainty about the effects over employer-employee relations. It is also believed that new forms of networked business organisations will improve the employee autonomy and responsibility and also create more jobs. Although there is uncertainty in the type of impact over work-life balance, it is expected to improve sustainability and environmental quality. Effects of new forms of networked business organisations on social cohesion and social exclusion or divides are also uncertain for most participants.
- Use of electronic networks for remote supervision (Statement 13: 'A major increase occurs in my country in the use of electronic networks for remote supervision of new kinds of work (tele-working, mobile working), and new atypical forms of work'). The use of electronic networks for remote supervision was perceived to have much the same effect over the selected factors as statement 12.

- Widespread use of ICT in e-governance (Statement 02: ‘Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country’). This was seen as a KS trend that will increase two industrial relations factors (economic growth / wealth creation, and entrepreneurship and innovativeness), but have no effect over employer-employee relations. Furthermore, the widespread use of ICT in e-governance will increase social cohesion and sustainability / environmental quality. A considerable number of participants believed that employee autonomy and responsibility at work would be increased but there is still a substantial amount of opinions that the statement will have no effect over the factor. Uncertainties about the impacts of ICT in e-governance were reported in the way it will affect social exclusion or divides, work-life balance and job creation.

Passing over a couple of KS items, the three KS developments with fewer influences on none of the features are worth mentioning:

- Social and employment policy interventions (Statement 21: ‘Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict’). Even though there were relatively few influences, this trend was believed to decrease social cohesion, employer-employee relations and work-life balance. Social exclusion and divides were believed to increase and a great deal of uncertainty was detected on the way this trend will affect entrepreneurship and innovativeness and employee autonomy and responsibility at work. Work-life balance deterioration and the rising of family stress and conflict was perceived as an independent, with disagreement about effects on job creation.
- Abandonment of common retirement notions (Statement 30: ‘Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to’). This was seen to positively influence economic growth / wealth creation as well as social cohesion. A considerable number of participants believed that the trend will increase employee autonomy and responsibility at work, but there is still a substantial amount of people who think that trend will have no effect over the factor.
- Promotion of labour market mobility (Statement 06: ‘EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations’). This was seen to impact positively on economic growth and wealth creation. It can also underpin entrepreneurship, innovativeness as well as to contribute to the creation of more jobs. But there was much uncertainty on how labour mobility influences any of the living condition features (social cohesion, social exclusion, sustainability and environmental quality), and more disagreement on employer-employee relations, employee autonomy and responsibility and work-life balance. The reasons for this high uncertainty would be interesting to explore further.

The point arises here that the small sample sizes from some countries makes it difficult to explore international differences. This is an important caution and is one reason for the focus on issues where there is wide agreement.

The discussion of KS developments could continue, but it is necessary to turn to the features that are being influenced:

- the factor that is promoted by most trends is **economic growth/wealth creation**; positively influenced by 10 trends; this suggests that the KS trends point towards the realisation of Lisbon strategy in this important respect;
- **entrepreneurship and innovativeness** was reinforced by eight KS developments, which is again good news for the Lisbon Objectives;
- **social cohesion** was reinforced by seven trends, inhibited by one, while three were uncertain. Again prospects look positive. A similar pattern was shown for job creation;

- more equivocal reinforcement was given to sustainability and environmental quality, employee autonomy and responsibility at work;
- weak influences were being exerted by KS developments on employer-employee relations, social exclusion or divides and work-life balance. The latter point is interesting, given that problems in work-life balance were seen as a general challenge arising in KS development.

Again, one can look at those topic statements that were generally regarded as ‘overstating’ KS developments (Table 7.4). These results will not be discussed in equivalent detail, but the most striking point is that these KS developments are also generally seen as reinforcing the positive features. Thus all seven KS trends were believed to increase economic growth, six were believed to increase social cohesion and employee autonomy and responsibility at work, and five were expected to positively influence the remaining features or undermine social exclusion. It should be noted, however, that these are ‘overstated’ developments. These positive results may not be achieved, or only partly in evidence, by 2015. They may well be important areas for policy attention in terms of the Lisbon Objectives.

### Delphi studies and knowledge society foresight

The wealth of material that can be generated from a survey of this sort is no doubt a major factor in the popularity of Delphi in foresight studies. Even with a fairly restricted number of participants, the online survey has generated numerous highly interesting and often telling results. The method may not always be the most appropriate one to employ, but it has the advantages of relative simplicity and comprehensibility.

Finally, it is worth noting that the range of topics that the survey dealt with was only a fraction of those that might have been considered. The Delphi was rather like sampling a huge area by sending probes to report on a number of discrete points. There may be contours and structures in a KS that remain unfathomed. In particular, the project team were disappointed by the exclusion of topics dealing with such classes of knowledge as genomics and nanotechnology, and more cultural social and organisational practices. These are bound to be classes of knowledge whose application will have significant implications for living and working conditions and industrial relations.

Table 7.4: Influences of ‘overstated’ topics

Statements	KS trends that overestimate the situation in Europe by 2015: implications for LC, WC and IR								
	Living conditions			Industrial relations			Working conditions		
	<i>Social cohesion</i>	<i>Social exclusion or divides</i>	<i>Sustainability / environmental quality</i>	<i>Employer - employee relations</i>	<i>Economic growth / wealth creation</i>	<i>Entrepreneurship and innovativeness</i>	<i>Employee autonomy and responsibility</i>	<i>Work-life balance</i>	<i>Job creation</i>
03	I4	D?	NE?	I	I	??	I	I?	??
15	I4-1	D	NE?	I	I	NE?	I?	I	NE?
16	I5-3	D	I?	I	I	I	I	I?	I?
17	I	D	I	I	I	I	I	I	I?
22	I4-3	D	I	NE	I	I	I?	I?	I?
26	NE?4	D?	SI	NE	I	I	NE	NE	I
31	I?	D?	I	I	I	I	I	??	I

**Key:** SI = strongly increases; I = increases; NE = no effect; D = decreases? = some uncertainty; ?? = very uncertain (bimodal distribution)

**Note:** statements listed in Table 7.2.

## **Experiences from the pilot countries**

This chapter uses some of the data sources of the previous chapter and the material from national workshops and scenario construction to examine in more detail the different patterns of development apparent in the three countries.

### **Indicators**

The earlier discussion of indicators drew attention to the north/south divide in the EU in terms of many of the indicators. A detailed comparison between indicators for the three pilot countries is shown in Figure 8.1. It clearly echoes this general disparity. Though there is much variety across the indicators, a common result is that Finland is well above and Greece well below the EU average, with Germany in a more or less average position. (The EU average is set as a benchmark score for each of the indicators, so a concise impression can be gained without needing to match two charts against each other.)

A somewhat more detailed examination tells a different story. Greece falls well below average on most indicators - mobile telephone use, teacher-pupil ratios, and the Gini index of income inequality are exceptions. Training and e-applications are areas where Greek performance looks particularly poor on the indicators, in contrast. But Finland achieves only average performance in terms of education and employment, e-applications, and wealth and satisfaction. Germany, in contrast, performs considerably better than average in terms of innovation ability.

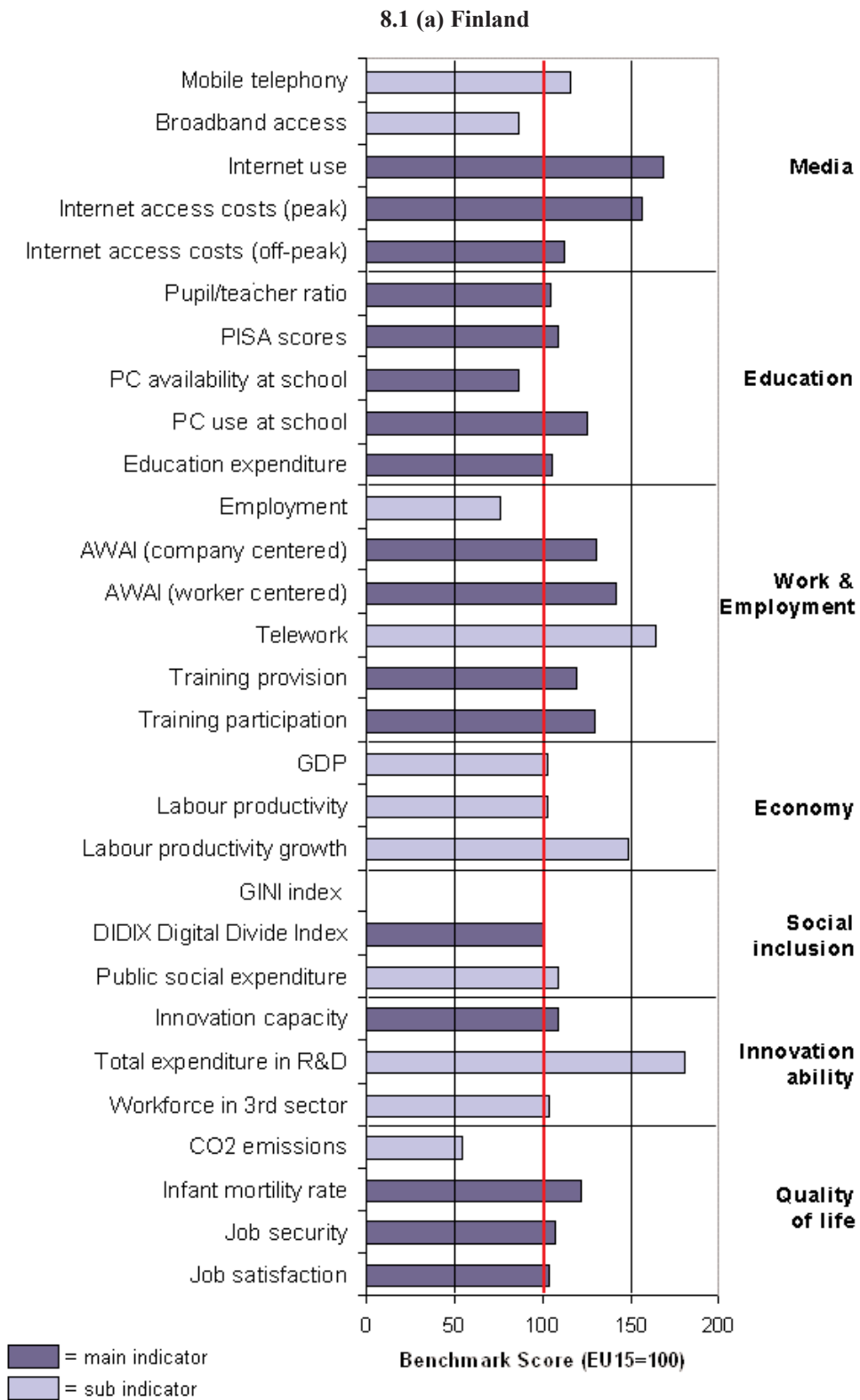
Indicators are just that - indicators.<sup>26</sup> It is not possible to capture the whole concept of innovation ability in statistics, just as it is only possible to capture some statistical elements of knowledge society more generally. There may be important activities missing (e.g. patenting and productivity measures are of debatable relevance to many services sectors). There are also special features in the countries' recent histories that go some way towards explaining both their general positions and the apparently divergent results obtained on some indicators (e.g. German reunification, Finnish economic reorientation in the wake of the implosion of the USSR). The implication is that one cannot be sure how far the complex pattern of results reflects 'temporary' or 'indicator-specific' contingencies and how far it describes the variety of structures and outcomes that can characterise a KS.

More detailed indicator analysis may be helpful in examining such issues, but the number of factors that need to be taken into account, and the relatively small number of cases (countries) that can be studied, suggests that more interpretative and qualitative methods may be required. For such reasons Euforia has also examined the case study countries using workshop and Delphi methods.

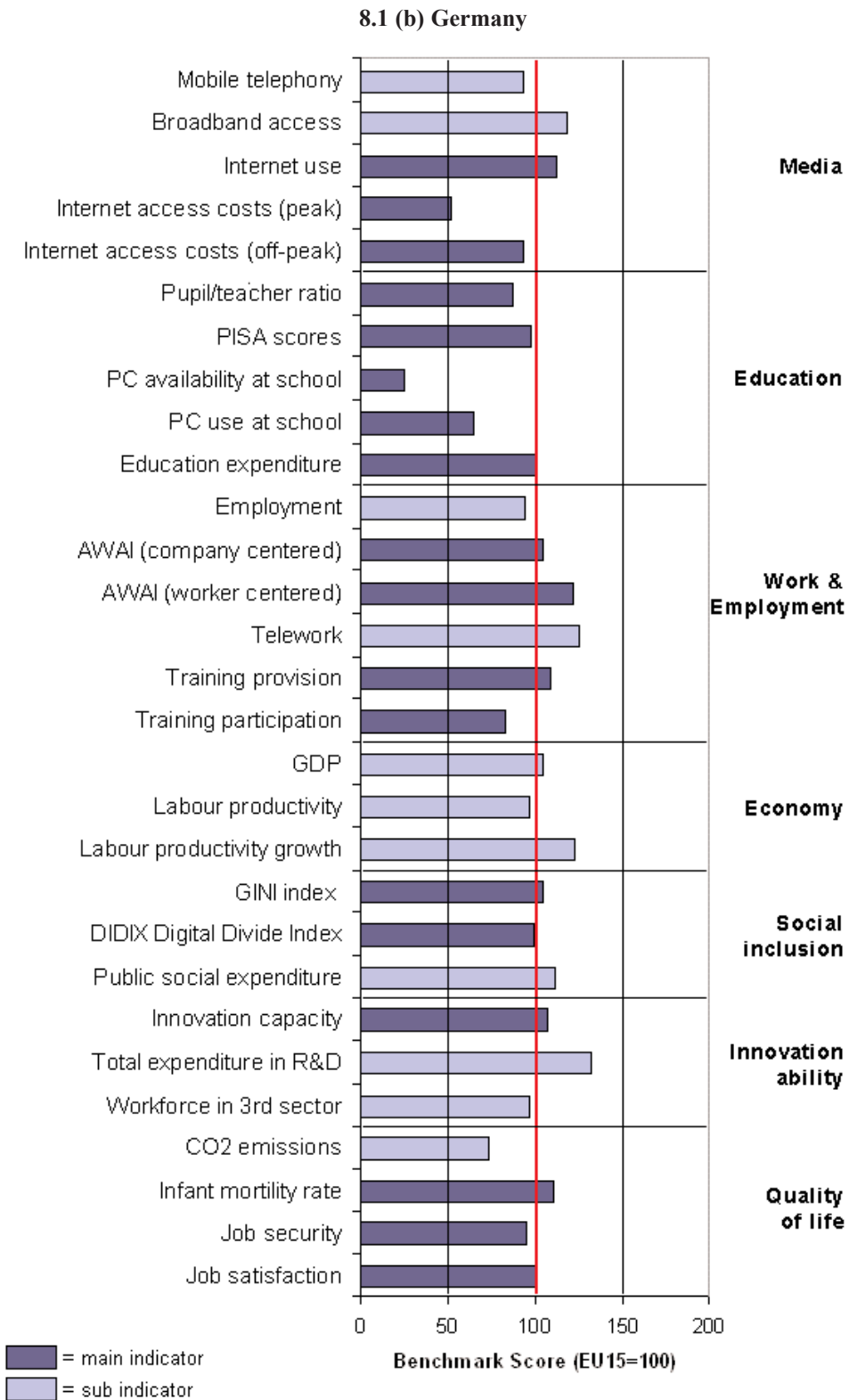
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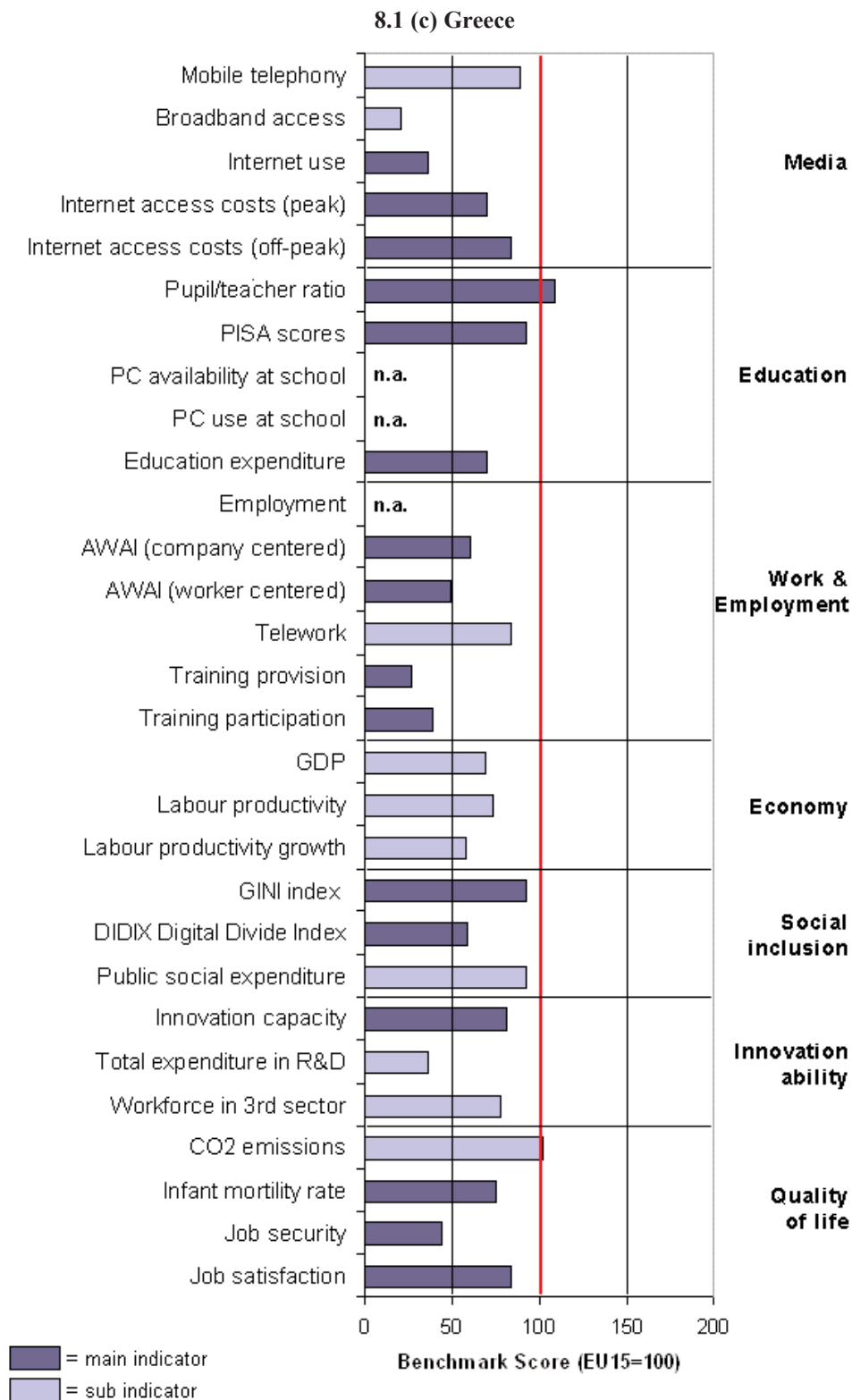
<sup>26</sup> KS indicators have to be interpreted in the light of other knowledge about the data and country circumstances. Statistics may mean one thing in one country and something quite different in another. For example: the high prison population in the US might give rise to a view concerning the US unemployment data. Also is the great amount of time spent by the US population watching TV (or is it just leaving the TV on while doing other things?) relevant to measures of knowledgeability?

Figure 8.1: Comparison of knowledge society indicators in three countries









### **Three country profiles**

In a nutshell, the highlights of these profiles are that in terms of these measures of a KS:

#### **Finland:**

- is typically a good performer compared to the EU average;
- performs well in terms of use of new media at acceptable cost;
- has high levels of PC use at school (despite low availability);
- relatively frequently features flexible forms of work, and thus a more flexible labour market;
- displays, despite this, continuing high levels of unemployment;
- features a relatively low diffusion of broadband access;
- has an educational system that performs only at average levels (and as noted, where PC availability at schools is low).

#### **Germany:**

- is very close to the EU average;
- features high levels of Internet and broadband use;
- shows development in use of flexible forms of work;
- has a moderate innovation ability;
- displays a problem of relatively high Internet access costs;
- is seriously lagging in terms of e-education.

#### **Greece:**

- nearly all the aspects of the KS indicators researched in Euforia are well below the EU 15 average. Thus Greece still has quite a way to go just to reach the level of the other EU countries.

This comparison confirms the initial decision to take these three countries as indicative of very different levels - and quite possibly different styles - of the development of a KS.

### **Workshops and the KS in pilot countries**

#### *The cross-national workshop*

The cross-national workshop was constructed to focus on the situation of the EU as a whole. Each break-out group was reminded that the focus area was the current EU 15 region. All the influences of the drivers were considered in terms of a time horizon of 15 years, for the geographic area of the current EU 15 countries.

However, participants had the opportunity to discuss and share their impressions about some particular driver-impact relationships within their own countries. Thus, some participants from Scandinavian and even pre-accession countries contributed with very remarkable and contrasting arguments and points of views. It was not our aim to capture these

points for systematic analysis. It would be extremely interesting to design a cross-national workshop that explicitly focused on variations across Europe, what underpins them, whether these represent opportunities or problems for the EU.

Several of the participants argued, in break-out groups and plenary sessions, that highly relevant differences in working and living conditions within EU 15 are liable to shape the KS in different ways. For instance, the point was made that, especially in Scandinavian countries, public social policies of fairly traditional kinds may still remain quite attractive for unemployed low skill workers, and for those designing policies to assist them. Therefore, a KS driver such as *'more demand for low skill services but decreasing supply'* might not reinforce (in those countries) the trend *'Take-up of unskilled jobs by economic migrants leads to friction between native and foreign workers'*. Methodologically and conceptually, this means that the causal relations between drivers and implications are not causal relations like those in physical sciences - *'if a happens then b will result'*. We are confronted with much more conditional ones - *'tendency b will be exacerbated by trend a unless...'*, or even *'trend a will give rise to the opportunity to respond in ways b, c, or d'*, for instance.

The main point is that members of this expert workshop - from both Northern and Southern extremes of the EU - were arguing against the notion of a homogeneous European KS. In some cases this may mean the persistence of existing institutional structures and cultural practices that will make the KS *'feel'* very different - and quite possibly have major impacts of the three areas of concern to the Foundation. In some cases this may also mean quite different social innovations and directions of change and experiment will be forthcoming across the EU. When and whether these reflect conscious decisions and strategic choices by governments and other major players, as opposed to the *'accidental'* outcome of many individual responses to KS (in markets and in everyday life), will affect the scope for policy action at EU and national level.

### *National workshops*

Two workshops were held in each of the three countries participating in Euforia. The second workshop devoted a large part of its time to scenario analysis, which is the subject of a separate section below. Other activities undertaken in the two workshops included an assessment of how the KS appeared in the countries in question, and how participants interpreted results from the indicators analysis. (There was little opportunity to discuss national Delphi results.).

### *Greece*

The feedback from the Greek workshop was unusually rich in that, in addition to supplying lists of trends, drivers, Delphi statements, it captured some elements of the conversation among participants about the nature of the KS in general, as well as the specific Greek situation

The information society, based on large-scale technologies and the use of new ITs, is part of the knowledge society. But the unprecedented abilities for the elaboration, storage and transmission of data and information are not enough for the production of knowledge. Co-operative procedures and dialogues are required for analysing and synthesizing the information to produce knowledge. In this sense, the human factor has the central role, as its absence or limited participation can make any new technology ineffective. Organisational changes that are needed for the elaboration and diffusion of knowledge and its effective integration in the organisation (knowledge management and/or sharing), which may be supported by new technologies and procedures, are of major importance. Excessive circulation of information and irrelevant and unprocessed data may hinder the production of knowledge.

The shape of the KS, and its efficiency and innovativeness, is thus not so much a consequence of technology drivers as of human and organisational factors. These require the implementation of new organizational models for effective management, diffusion and production of knowledge. The supply of specialized knowledge-intensive services to

companies that have inadequate internal processes for the management, diffusion and production of knowledge was thus considered to be of major importance. (Even with such services, there is a need for organisational to be able to effectively absorb the new knowledge offered - knowledge transfer as well as in technology and know-how transfer.)

Some of the specific issues confronting Greece, which might help account for the country's performance in terms of the indicator analysis, were:

- Greece is dominated by a **hierarchical culture** concerning the creation and administration of knowledge. This hinders effective integration, management and diffusion of knowledge within the existing organisational frameworks, and also prevents the adoption of the required new organisational models. The workshop concluded that the result was that Greece cannot be considered as heading towards a knowledge society.
- The **structure and operation of the market** in Greece is a major issue. It affects (a) the knowledge gathered within the production sector directly affects the productivity, innovativeness and competitiveness of the economy and (b) the general educational background of the society affects the development and evolution of the productive sector. The influence of these two parameters on the development of a KS depends on the structure and operation of the market. Limitations on the 'open-market' model and 'healthy' competition were seen as hindering Greece's development towards a KS.
- The **difficulties identified in Greece** have to do with the lack of openness in the national market, and ineffective or limited competition in the economy. Much of the production sector survives through such means as protection through legal arrangements, public procurement, subsidies, oligopolies, etc. Thus, the development of the necessary infrastructure and the search for a path towards a KS does not form a priority for crucial parts of the economy and society - public administration, public enterprises and organizations, higher education institutes, public research bodies, enterprises with the state as their main client, the suppliers of these enterprises, etc. In those production sectors where competition is more effective (for instance the IT sector) a large number of enterprises do seem to have the necessary dynamism for the integration into a knowledge economy. Their successful integration, however, depends on the degree to which the wider obstacles in the economy are tackled.

### *Finland*

The Finnish workshops identified quite different sorts of factors as responsible for the shape that the KS might be taking in Finland.

- The participants argued that the Finnish '**welfare society**' has been key in the development process from industrial society towards KS. The Finnish government has been able to invest strategically, preventing the growth of inequality, which has helped this sustainable societal development. For instance, the decision to maintain basic services such as schools and libraries in rural areas has prevented polarisation. (Finland has also started to utilise IT - such as virtual health centres - in order to maintain services in peripheral areas.) Also the government's strategic decision to **invest in factors creating innovations**, such as good basic education and R&D has been a factor creating positive KS development.
- **Cultural factors** have also had an influence. For example: women have generally been participating in working life; Finns are accepting and even uncritical towards new ways of doing things (thus IT has become a matter of course younger generations); there is a protestant work ethic with high commitment to work.
- There has been a **coincidence** of fortunate features, with the best-known example being Nokia's decision to produce new IT instead of conventional consumer electronics in the early 1990s.

The Finnish workshop was not celebratory and raised some points of concern for the future KS. Finnish productivity has not increased despite the use of IT, and this is liable to lead to future economic and competitiveness problems. Perhaps related to this, the constant requirement to update IT costs Finnish society a great deal. There is a vicious circle of continuous, compulsory technical investments.

### Germany

Several features of the German economy and culture were thought to contribute to the 'average' performance of Germany on many of the KS indicators:

- Germany's economic strengths lie in the manufacturing industry and industry (e.g. mechanical engineering, car industry, chemical industry) - but there is a **weakness in the service industry**. The German economy has more problems than many other countries with the 'export of knowledge', which will be a leading force for the creation of wealth in the KS. German companies have proven to be highly innovative, but the strength of the economy may have led Germany to become rather inactive in future-oriented areas and industries like IT and biotechnology. Following and catching-up in these sectors has been possible due to the good learning aptitude of German companies and workers.
- **Taxation of labour** is extremely high, resulting in very high labour costs. It is believed that a shift of these taxes to consumption / excise tax is needed to achieve greater competitiveness. **Consumer spending** is out of alignment with investment, which is at a low. Economic growth purely on the basis of consumer spending is not feasible, and active measures are required from government and other key players.
- In Germany (as in most other European countries) there is a **lack of entrepreneurship**, which could positively contribute to growth. The situation seems to be quite the opposite in the US.
- There is a **dependency culture**. Most Germans are seeking a dependable job and are not interested in any form of self-employment or any form of employment bearing more risk. This mentality is a strongly rewarded dependency with good payments and wages. Employee mobility on the labour market is restricted because unemployed people do not wish or cannot afford the additional mobility costs for insecure opportunities. If those who require the services carry the costs of moving - as it was with the ministries for the relocation to Berlin - then these problems could be met efficiently. In this and other areas, the **small regional structures** hinder supra-regional, overall strategies.
- The **education system** undoubtedly shows some strength with its dual education system and qualified employees in a number of professions. However, the education and training system is strongly structured, for instance there are different school types (e.g. secondary, middle, grammar, vocational schools, etc) with very low interchangeability. Once a path has been chosen, permeability upwards is very difficult even with good qualifications. To survive in a KS, citizens have to be as highly qualified as possible and have a high level of education. In Germany there is both a lack of variety and a lack of differentiation in the support measures available in schools, where support for the weaker student should go hand in hand with opportunities to stretch the most able students ('two speeds'). There are no special systems for the promotion of excellence, which could help gain a better position in comparison to other countries in the 'creation of genius'. A stronger differentiation of the education system is needed - not a blocking of the best - more consideration for the actual wishes and more involvement of the students. There is a (exaggerated) **certificate culture** - certain activities and professions or establishing a company requires particular certificates. While these may create trust and transparency, they are liable to be anachronistic by 2015. European harmonisation is necessary. This was seen as only being possible on the basis of certificates (not in non-certificated elements of knowledge), although the workshop participants felt that the increasing abstractness of requirements no longer allows the gain of competence solely through 'experience'.

- **Political structures** were mentioned several times. The multi-level government system gives federal states (in many cases) the power to veto decisions taken by the federal government. With different political constellations in the two parliamentary chambers, there have been 'blockades' on many major policy initiatives. There is an urgent need for mechanisms to avoid such blockades in the future. Though decision makers have recognised the problem of the heavily ageing society, there is a deficit in planning and discussion for new models of **social insurance**. The financial and other margins, e.g. for the creation of employment opportunities for older employees so that they can again contribute to the social security system, are further limited because of necessary investment in the reconstruction of the East (in the past years this has cost billions, and will continue do so in the future - partially financed from social insurance funds). Germany is a **society of compromise**, which always aims at a balance (of motions). Mechanisms for achieving compromise are in place (e.g. the social partnership model). As a consequence, political extremes are limited. However, this sometimes constrains more radical structural reforms - which are urgently required in Germany in many areas. Germany also seems to have a handicap simply due to its large size, which makes it very difficult to be as flexible as smaller countries.
- In contrast, Germany is a society with **social extremes** regarding many features of the emerging KS, such as Internet use, education, qualifications, etc. There is a lack of integration of immigrants. Since immigration was believed to be a temporary phenomenon, appropriate support (e.g. language training) was lacking.

### **Overview**

The workshops cannot hope to delve as deeply into the circumstances of national societies as could specialised studies - for instance, Finland's 'success story' has attracted a number of detailed studies in recent years. But they do point to a number of significant factors in each country that were seen as shaping the KS liable to arise in them. Some of these factors might well be characteristic of much of the EU - rigidities of various sorts, dependency cultures (of one form or another), lack of entrepreneurship, and even coincidence. On the other hand, the workshops suggested that there were real benefits from investments in education and social inclusion, alongside economic flexibility and openness.

The pilot countries represent the extremes of KS development as suggested by indicator analyses. But the variations among them in terms of factors such as institutional rigidity and educational structures are ones which other EU countries also vary in. Thus it is quite possible that the emerging KS in Europe will continue to be strongly differentiated - in degree and style of development.

### **Drivers of the knowledge society**

The workshops asked participants from the three countries to discuss drivers (sometimes they identified trends) of KS development, grouped into STEEPV categories. The long list of topics that was elicited is reproduced in boxes 8.1 to 8.8.<sup>27</sup> The original formulations have not been edited to allow for the flavour of the points to come through.

The accounts cover a vast range of topics, illustrating the point that a KS is a topic that has implications for practically all areas of social and economic life. They demonstrate, too, that there are various developments thought likely but not thought altogether desirable. Several topics evoke considerable uncertainty, too, indicating that there may be room for choice, or that the underlying dynamics remain poorly understood.

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<sup>27</sup> The statements are identified in these boxes as follows: F = Finland, using 0-5 scales; D = Germany, where the score reflects the number of votes accorded to an item's importance by the participants; H = Greece. Some of the German texts have been captured from post-its attached to notice boards, so there are typically several rather different points made under each broad heading. In contrast, the Finnish and Greek texts, and, indeed, most of the German statements, represent more of a consensus viewpoint about the driver.

Similar issues are generated in the analysis of the European KS overall, but it is striking how different the national drivers and prospects are. Admittedly, many themes recur from country to country, and it is significant that stakeholders and experts from such widely differing countries share so many views - and concerns - about the KS. But these tables also often focus on national problems on the path to a KS. There is some lack of correlation. Indeed, in the Finnish case, where data are sufficiently quantified to allow comparison, there appears to be a negative correlation between desirability and likelihood. Various positive developments of a Finnish KS are spelled out, but these are almost invariably thought to be unlikely, an interesting result to explore in further analyses. Ratings of desirability and likelihood could prove a useful tool here.

### Box 8.1 Social drivers/developments

- **F: Life fragmented into series of projects.** World becoming more and more project oriented. This situation cuts both private life and working life into many pieces and reduces possibility to long-term planning. *Desirability: 0 Likelihood: 2*
- **F: Growing significance of education.** Significance of basic education and lifelong learning is becoming more and more important. Education will be more important, since skill requirements increase and it is becoming more necessary for people to change their path of career several times. *Desirability: 2 Likelihood: 1*
- **F: Mobility** Immigration and emigration will boom. This increases multiculturalism. *Desirability: 1 Likelihood: 3*
- **F: Increasing stress** Effectiveness requirements are being emphasised both in working life as well as in leisure time. That is why people suffer from stress. This leads on to situation that burnout and depression are becoming more general. *Desirability: 0 Likelihood: 3*
- **F: Social inequality** Social inequality will increase in the future. This leads to polarisation: On one hand there are successful high-income, highly educated workers and on the other hand there are poorly educated low-income workers, who can easily drop out. *Desirability: 0 Likelihood: 2*
- **D: Organisational set-up and culture which recognises the human being and puts them at the central focus** (29) New business forms for dealing with knowledge workers (away from the paradigm of the 'screw factory') arise where the human being is seen as the central success factor and guarantor. The increase of knowledge-based work leads to an increased need for qualifications. It will lead to an intensification of lifelong learning and result in significantly fewer continuous employment biographies, i.e. everyone will carry out a sequence of different 'occupations' during their lifetime. Employment will become an episode in an otherwise leisure oriented life. As a whole, variety and the wealth of choice in society and lifestyles will increase. It will result in a flexibilisation of employment law and an increase in insecure employment with simultaneous longer and more flexible working hours. The lack of qualified workers cannot be offset by a higher quota of female workers. The question of where stabilising anchors for individuals can be found in the future when the previous ones (workplace, family, regional surrounding) have been lost remains unanswered.
- **D: Ageing society** (13) The continually increasing over-ageing in the shrinking society leads to changes in values, needs (e.g. regarding ICT) and also to generation conflicts which among other things result from the fact that the older section of society also increasingly determines the markets.
- **D: Digital divide (quality-related, power-related)** (11) The digital divide is still a central topic in 2015. 'Nonliners' will be left behind more and more. The further privatisation of the educational system exacerbates the social differences and the restriction of access to valuable information (which is only accessible through payment) leads to a further social polarisation of society.



### Box 8.1 Social drivers/developments (cont.)

- **D:** Professionalisation/ de-professionalisation (3) Services in all areas of life, previously provided by relatives or volunteers, experience a professionalisation, i.e. they are increasingly offered as a professional service by third parties (for a current example the provision of professional care services by service providers through the introduction of nursing care insurance in Germany).
- **D:** Individualisation (2) Individualisation is intensified through ICT, social contacts become increasingly commercialised (already today through introduction agencies and fitness centres). For certain target groups (e.g. pensioners, disabled) the Internet is becoming their ‘access to the world’ from which they would otherwise be largely excluded. Social control (e.g. consumer behaviour) via ICT and digital rights management technologies is increasing: ‘1984’ happens in 2014.
- **D:** Medicine and individual responsibility (‘DIY medicine’) (-) The health system is subject both to heavy cost pressures and consequently to change. Citizens will increasingly use self-medication before undertaking a billed visit to the doctor.
- **H:** The ‘globality’ of enterprises causes greater complexity in business management, differentiates the local labour markets and enhances the development of innovation systems at regional/local level (innovation islands).
- **H:** Constantly, more and more weight is placed on the exploitation of the knowledge and experiences of ‘old’ employees (third age) and the use of new technologies that contribute to this exploitation.
- **H:** The ‘conservative’ organizational culture characterizing some areas mainly in Southern Europe results in the widening of the ‘distance’ between subordinates and senior employees and therefore hinders the diffusion of information and the production of knowledge.
- **H:** The culture and ‘mentality’ (which may be different for example between the South and the Central - North Europeans) affects the level of development of the knowledge society in each country.

### Box 8.2 Technological drivers/developments

- **F: Network society** The society is changing more and more into network society. People take more advantage of the Internet. Internet will be used e.g. as a source of information and distribution channel in daily life. *Desirability 0 Likelihood: 1*
- **F: Normalised ICT usage** ICT usage will be normalised and skills to use ICT will become very common. Use of ICT will become a part of all work. For instance IC technology will be used in building trade, cleaning branch as well as in expert tasks. *Desirability:3 Likelihood: 4*
- **D: Increased importance of human resources** (14) Organisations increasingly realise the high importance of human resources and treat them equal to investments. At the same time however, human resources form the limit of flexibilisation and the implementation of technology, i.e. certain groups of people do not have the requirements for an essential further flexibilisation and ICT use, others refuse. Both have effects on the employability of these groups.
- **D: Intelligent agents** (12) Intelligent personalised agents (‘intelligent agents’ such as autonomous research agents, avatars, improved virtual reality, individual knowledge maps) with new ‘intelligent’ human-machine-intersections/interfaces will be widespread to help cope with the flood of information and to create transparency.
- **D: Media convergence** (8) Convergence of currently still different media (e.g. PC, TV, mobile communication) will be completed.

**Box 8.2 Technological drivers/developments (cont.)**

- **D: ICT is becoming an everyday occurrence** (3) ICT has taken hold of all areas of life and is widely used. Mobile use of the Internet is becoming a matter of course. E-learning has increased further, in private households as well as organisations.
- **D: Technology assessment** (2) Development and research of technology will orient themselves stronger than today and will be linked to the ‘needs’ of society. This is accompanied by an early examination of the sustainability of technological developments.<sup>28</sup>
- **D: Knowledge archiving and necessary selection of relevant knowledge** (-) In line with the development of continually growing digital libraries questions occur regarding necessary selection on the one hand and, on the other hand, secure electronic long term archiving of information and knowledge of digital as well as ‘analogue’ information (e.g. books) from the past centuries.
- **H:** The ability for DNA screening and ‘reading’ is used for tracking the properness of people for work and education and the forthcoming health needs for insurance reasons. This results in the exclusion of certain groups and the appearance of a new form of discrimination (not any more due to racial or social reasons but for ‘biological’ reasons).
- **H:** The information society through the use of computers, which can only be developed by some groups, contributes to the development of a new form of social discrimination, the ‘digital divide’.
- **H:** The use of new technologies is restricted by the concerns of the civilians regarding the protection of their personal data (privacy especially at work), the inadequacy of the legal framework concerning IPR protection issues and the tendency towards political control of the information.
- **H:** New social and political movements emerge defending the rights of the civilians for privacy against the abuse of personal data from companies and organizations (to identify preferences of customers, ‘suitability’ for work and education, forthcoming health problems, etc).

**Box 8.3 Economic drivers/developments**

- **F: Population ageing** Ageing of population structure will bring new changes and challenges in working life such as labour shortage and longer careers. Population ageing increases also the demand of services. *Desirability: 0 Likelihood: 2*
- **F: Production sector still important factor in KS** Also in the knowledge society there will be a branch of economy that is based on production. Production sector is just widely utilising IC technology. *Desirability: 0 Likelihood: 1*
- **F: Networks and globalisation** Networks between different economic actors and product chains increases. This is a consequence of globalisation. Though it is not just multinational companies that emphasise networking, but also small and medium-sized enterprises appreciate that networking brings competitive advantage. *Desirability: 1 Likelihood: 3*
- **F: Networks and hierarchies** Networking leads to the development of new types of hierarchies in working life. Hierarchies will also rise, since owing to networking the need for control and supervision from a distance increases. *Desirability: 0 Likelihood: 1*

<sup>28</sup> The following text from Germany may be associated with this item: ‘The emerging understanding of long-term risks to health means that by 2015 there is no more cellular mobile network.’

**Box 8.3 Economic drivers/developments (cont.)**

- **F: Diversified organisation of work** Organisation of work will become more multiform. Teleworking and other forms of atypical work will be more common. Term - atypical work - will lose its original meaning. *Desirability:1 Likelihood: 1*
- **F: Innovations and competitive advantage** Innovations will be one of the most important factors bringing competitive advantage. Not only product innovations will play a major role in bringing competitive advantage, but also service, managerial and organisation innovations are very important. *Desirability: 3 Likelihood: 2*
- **F: Crisis of management system** On the one hand need for democratic dialog will grow. But on the other hand these new ways of governance faces old, authoritarian management system. This generates friction in the development process of management systems. *Desirability:1 Likelihood: 1*
- **F: Polarisation of labour** In the economy labour force will be more polarised. Labour force is divided into two groups: highly skilled experts and low-skilled workforce performing physical work. *Desirability: 0 Likelihood: 2*
- **F: Flexibility** Flexibility increases both in working life as well as in family-life. Flexibility arises from employees needs. *Desirability:2 Likelihood: 3*
- **F: Enlargement of European Union** Enlargement of European Union has an effect on working life. The enlargement increases number of immigrants and thereby multiplies the quantity of labour force. *Desirability: 1 Likelihood: 3*
- **F: New occupational structure decreasing polarisation** Change of occupational structure can be a factor increasing more equal division of work. For instance constantly growing service sector will be dependent on the whole working population of a society. *Desirability:2 Likelihood: 0*
- **F: Increasing availability problems of workforce** The availability of workforce will be more problematic than earlier. On one hand there is a shortage of skilled experts, but also recruiting of low-paid workforce will be difficult. *Desirability:0 Likelihood: 3*
- **D: Networking and outsourcing** (9) Location independent work in networks (networking) will be widespread in 2015, telework is becoming normality. Organisations will increasingly outsource work which will further accelerate the development to global networking.
- **D: Employees' participation in organisations (capital, decisions)** (6) In order to be successful in the market, organisations will increasingly develop and introduce new models for employees' participation. These relate to employees' share in organisations' decisions and capital. Such 'legitimate' and serious share models increasingly determine organisations' success.
- **D: The role of low productive non-knowledge work** (6) Low productive work in all areas (incl office jobs) will either be rationalised by ICT, low paid, subsidised or carried out through moonlighting. It will result in increasing differences in income compared with knowledge workers and thus lead to a greater polarisation of society.
- **D: Concentration and monopolisation of organisational landscape and content** (6) In the course of the development of the knowledge society a further increasing concentration and monopolisation of the global organisational landscape can be expected. This means that in the future in each sector some few global players will determine and control the market. A similar development will also take place regarding content, i.e. some few organisations will become the key organisations regarding content provision.
- **D: 'Leasing instead of buying'** (3) In the knowledge society possession of goods (not just regarding ICT) will lose in importance. Goods, e.g. technology based services, will increasingly be leased. This means that organisations and individuals will pay for use rather than for possession of goods (e.g. software). Suppliers will develop suitable user licences and bring them into the market.

**Box 8.3 Economic drivers/developments (cont.)**

- **D: Less income from dependent work, more from capital and self-employed work** (2) Employees will increasingly realise their income through self-employed work and accumulated capital (Keyword: 'I Ltd'). Dependent employment, the currently still dominant work form, will lose in importance.
- **New growth market: e-health** (-) For many and - also because of the demographic development - rapidly increasing groups of people health and wellness are becoming important topics. These will develop into new growth markets; an eHealth market which will further accelerate the development to a knowledge society will emerge.
- **D: Domestic structure of the tertiary sector. Necessity for new indicators** (-) Knowledge-based activities will increase in the knowledge society. Along with this comes a further fanning out of the tertiary sector whose statistics is only unsatisfactorily recorded and covered. Here it is necessary to develop new statistical indicators for an improved gathering and measurement of these developments and characteristics of the knowledge society
- **H:** There is a global information system developed, accessible by every point and by every electronic device that allows people to create, locate, share and manage information, which enables them to provide services for several organizations.
- **H:** The increase of the speed and capacity during the transmission and management of the information as well as its transformation into knowledge brings about more demands on the employees for more complex work. This leads to the increase of working stress and the distortion of the balance between work and personal life.
- **H:** The development of teleworking, part-time occupation and self-employment enforce some trade unions to develop new forms of strategies in order to cover the new, emerging needs of these new working groups.
- **H:** Three types of 'workers' are created: a) those doing routine work (e.g. telephone operators, secretaries, data entry, bank cashiers, industrial workers) either using IT or not in their work, b) those rendering 'personalized' services (personal secretaries, customer service providers, waiters, etc) and c) those who perform complex tasks demanding decision-making, problem solving, information analysis and synthesis activities. These three groups appear in any sector and thus create new rules in the hierarchical structures concerning the evolution of the personnel at work, in the salaries, etc.
- **H:** The rapid change in the knowledge background needed for specific jobs and thus in the job characteristics, as a result of the Knowledge Society, may result in an increased need for changing jobs or for creating new specialities. This will be a challenge for securing the working rights of the employees.
- **H:** The changes in working conditions, as a result of the Knowledge Society, cause changes in personal life (disturbance of balance between working and personal time and space) and in the family structures relating to the person's role in the family.
- **H:** New social and political movements appear supporting the new living and working styles and values, in parallel with new-romantic movements supporting the revival of the old living and working styles and values.

#### Box 8.4 Ecological/environmental drivers/developments

- **F: Environmental ideology broadening** Environmental issues are being emphasised in every field of operation. Principles of sustainable development will be in on community planning and production etc. *Desirability: 5 Likelihood: 3*
- **F: Increasing dematerialisation and immaterialisation** Principle 'getting more from less' leads to the concept of dematerialisation and immaterialisation. Dematerialisation and immaterialisation increases in production and consumption. Citizens get more welfare from less use of material products and less environmental outlets in consumption. *Desirability:0 Likelihood: 0*
- **D: Ambivalence regarding environmental burdens through the knowledge society (5)** There are two contrary hypotheses: (a) The increasing non-materialisation of the economy reduces the environmental burden; (b) There will be increasing worldwide environmental pollution in the knowledge society. Environmental pollution is also increasing due to the further polarisation of societies and economies in the world as well as the increasing poverty (as is currently noticeable in the developing countries).
- **D: Sustainability is anchored in society, problem awareness is present (5)** The principle of sustainability is deeply anchored in large parts of the population. Europe has developed into a leading force in the area of development and use of environmental technologies.
- **D: Effects on regional structure and urban development (-)** Life and Work become geographically closer again. As a result the inner city office towers will become the industrial ruins of tomorrow. Problems with worsening traffic gridlock will significantly push forward the wide application of ICT.
- **H:** The development and dissemination of new technologies is decelerated due to the adoption of the precautionary principle in decision-making.
- **H:** Serious climatological changes continue to appear at global level in the years to come. Information technologies are broadly used in environmental training and for sensitising societies about environmental issues.
- **H:** Due to the ecological and environmental problems, the preferences of a large proportion of the consumers concentrate more and more on products that are not harmful to the environment (with long 'life cycle' and ability for recycling) applying the notion of 'the lesser of two evils'.

#### Box 8.5 Political drivers/developments

- **F: Local politics and democratisation** The potential for totalitarian regulations diminishes. Instead local democracy is increasing. Power is more and more devolved to regional governments and local associations. *Desirability: 1 Likelihood: 1*
- **D: Regulation (12)** Regulation through politics is decreasing due to an increasing privatisation of state services. Because of the worldwide network, security of use and possible emergency scenarios are given increased importance. Security policies must ensure security in data networks. However, it remains to be seen how far this will be realised by 2015.
- **D: Copyright, intellectual property (10)** Property or licence rights for knowledge are becoming an important topic (e.g. gene patents) and the handling of intellectual property is becoming a political key decision.
- **D: E-government is reality (9)** The increasing complexity of administration forces an extensive use of ICT. E-government will be widespread in 2015 but will also have met its limits. E-democracy will be an integral constituent of e-government.

**Box 8.5 Political drivers/developments (cont.)**

- **D: National state versus Europe versus globalisation (power relationships)** (4) The further advancing globalisation leads to a further decrease of national leadership through politics. In spite of advancing globalisation citizens will continue to think (small) regional and be segmented.
- **D: Political opportunism and political abstinence** (2) A continuing 'political opportunism' in favour of the voting majority of the elderly will aggravate the political abstinence of the young. This will result in an 'over-ageing' of politics which will lose sight of certain target groups.
- **H:** Knowledge diffusion through the new technologies allows broad accession of information sources that used to be accessible only by few in the past.
- **H:** E-governance enhances transparency in the procedures concerning the relationship between the citizens and the state.
- **H:** The role of non-governmental organizations (NGOs), as defenders of the rights of the civilians to access information and to participate in the decision-making, is strengthened because of the lack of trust in specialists.
- **H:** The role of the mass media becomes more and more important concerning the 'popularisation of knowledge' and the understanding of scientific issues by society.

**Box 8.6 Values drivers/developments**

- **F: Ethical aspects in the society** Emphasising ethical aspects increases in working life and business. For instance justice and equality are becoming significant values. Humane social life is becoming more and more important part of development *Desirability: 6 Likelihood: 0*
- **D: Medialisation of life** (9) There will be a US-Americanisation of the media: everything that increases market share will be broadcast. There will be a split society regarding media competence and the emergence of even more sector programmes - analogous to the development on the magazine/printed media market. There will be an often unquestioned belief in the Internet: 'What is on the Internet is true.' Nothing will be believed any longer, reality is no longer expected behind information. Increasingly, simulation is displacing reality. People lose the ability for face-to-face communication. Access to ICT and telecommunication networks will be free of charge. ICT competence will be defined as a general qualification. There will be a commercialisation and monopolisation of intellectual property.
- **D: Wider definition of work, work-life-balance** (9) 'Work' receives a much wider definition and will surpass the classical employment. Work also plays a smaller role in determining status. People increasingly search for a work-life-balance.
- **D: Diversity and tolerance (different speeds, fairness)** (4) Diversity of values, mix of religions, new philosophies determine the period around 2015. Older people are in the majority and dominate politics: either right to vote for children or only voting up to the age of 75. There will be distribution conflicts between the generations. There will be a large need for security and stability. The question is: who will deliver this? Fairness of distribution as a global benchmark will become a central topic which will be unavoidable for world coexistence.
- **D: Lifestyles** (2) People increasingly forego long-term relationships. This will mean an increase of so-called 'patchwork families'.

**Box 8.6 Values drivers/developments (cont.)**

- **H:** The Information Society may hinder the development of the Knowledge Society. The Information Society reinforces the use of computers and teleworking and acts as a negative factor in communication and personal contacts, which may result in the decrease of dialogical procedures that are necessary for the production of knowledge.
- **H:** The absence, in some cases, or the abuse, in others, of intellectual property rights decelerates the diffusion and creation of knowledge.

**Country-specific KS trends and issues**

Each workshop considered the implications of the drivers discussed above for the development of the KS in their countries. Below we summarise major points arising for each country. Again, it is remarkable just how much variation there is from country to country.

*Finland*

Three broad classes of issue were identified as critical to Finnish development. Among the **economic issues** were:

- New Finnish model of working life: Finland is capable of creating a new model of working life. This model assists Finnish working life to utilise all reserves of talented workforce. *Desirability: 5 Likelihood: 0*
- Role of trade unions strengthens. Since work will be decentralised by changing nature of work, the role of trade unions becomes more important than earlier. The reason for this development is that trade unions have foreseen, what changes in their operations are needed. For instance trade unions have started to offer new types of social security and other services. *Desirability: 2 Likelihood: 0*

**Political issues:**

- Ensuring welfare society. It is still very important to sustain the welfare society of Finland. It is very important to prevent a development where the information society has control over everything. It is essential that Finnish society for instance takes care of disadvantaged people by maintaining competent basic services. *Desirability: 2 Likelihood: 0*
- New political emphasis - a response to an ageing society. Transition of age structure is causing changes in values of Finnish society. This leads to a political re-emphasis. Changes in population structure require e.g. effective retirement income policies and new health care reform. Therefore service society and information society exists simultaneously. *Desirability: 0 Likelihood: 3*
- Rationalisation of administrative structures. Rationalisation of administrative structures increases. In the transformation process a sustainable regime will be the optimum and this increases the role of communities. For instance cooperation between sub-regions is a prime example of this rationalisation process. *Desirability: 0 Likelihood: 0*

**Values issues:**

- Heterogeneity of Finnish culture. Heterogeneity of Finnish culture and values is growing. Finns are not as homogenous as they used to be. *Desirability: 0 Likelihood: 2*

This workshop gave rise to a discussion of two alternative developments of Finnish regional policy (in effect, the beginnings of two scenarios - though neither was rated as very likely):

- Strengthening of the centralisation process. Finland centralises more and more to urban cores (so-called technology centres). On the other hand, the situation of sparsely populated areas becomes weaker. The periphery undergoes a negative growth of population and decline of services. *Desirability: 1 Likelihood: 0*
- Sustainable regional development. Finland - including its periphery - must be populated in every possible way. This is a policy that will be carried over also to the knowledge society. Therefore it is very important to maintain the social infrastructure also in the countryside, since the social capital of the countryside's adolescents involves a potential for innovations. *Desirability: 3 Likelihood: 0*

**Germany**

The German workshop used a method (Metaplan) that allowed for the participants to mark the topics in points. The more points a topic receives the more important experts deem it to be. Here only those topics that received six or more points are featured (which does not mean that other topics are not interesting).

**Economy:**

- Networking and outsourcing (9)

Location independent work in networks (networking) will be widespread in 2015, telework is becoming normality. Organisations will increasingly outsource work which will further accelerate the development to global networking.

- Employee participation in organisations (capital, decisions) (6)

In order to be successful in the market, organisations will increasingly develop and introduce new models for employee participation. These relate to the employees' share in organisations' decisions and capital. Such 'legitimate' and serious share models increasingly determine organisations' success.

- The role of low productive non-knowledge work (6)

Low productive work in all areas (incl. office jobs) will either be rationalised by ICT, low paid, subsidised or carried out through moonlighting. It will result in increasing differences in income compared with knowledge workers and thus lead to a greater polarisation of society.

- Concentration and monopolisation of organisational landscape and content (6)

In the course of the development of the knowledge society a further increasing concentration and monopolisation of the global organisational landscape can be expected. This means that in the future in each sector some few global players will determine and control the market. A similar development will also take place regarding content, i.e. some organisations will become the key organisations regarding content provision.



### **Technology:**

- Increased importance of human resources (14)

Organisations increasingly realise the high importance of human resources and treat them equal to investments. At the same time however, human resources form the limit of flexibilisation and the implementation of technology, i.e. certain groups of people do not have the requirements for an essential further flexibilisation and ICT use, and others refuse. Both have effects on the employability of these groups.

- Intelligent agents (12)

Intelligent personalised agents ('intelligent agents' such as autonomous research agents, avatars, improved virtual reality, individual knowledge maps) with new 'intelligent' human-machine-intersections/interfaces will be widespread to help cope with the flood of information and to create transparency.

- Media convergence (8)

Convergence of currently still different media (e.g. PC, TV, mobile communication) will be completed.

### **Social issues:**

- Organisational set-up and culture which recognises the human being and puts them at the central focus (29)

New business forms for dealing with knowledge workers (away from the paradigm of the 'screw factory') arise where the human being is seen as the central success factor and guarantor. The increase in knowledge-based work leads to an increased need for qualifications. This will lead to an intensification of lifelong learning and result in significantly fewer continuous employment biographies, i.e. everyone will carry out a sequence of different 'occupations' during their lifetime. Employment will become an episode in an otherwise leisure-oriented life. As a whole, variety and the wealth of choice in society and lifestyles will increase. It will result in a flexibilisation of employment law and an increase in insecure employment with simultaneous longer and more flexible working hours. The lack of qualified workers cannot be offset by a higher quota of female workers. The question of where stabilising anchors for individuals can be found in the future when the previous ones (workplace, family, regional surrounding) have been lost, remains unanswered.

- Ageing society (13)

The continually increasing ageing in the shrinking society leads to changes in values, needs (e.g. regarding ICT) and also to generation conflicts, which, among other things, result from the fact that the older section of society increasingly determines the markets.

- Digital divide (quality-related, power-related) (11)

The digital divide is still a central topic in 2015. 'Nonliners' will be left behind more and more. Further privatisation of the educational system exacerbates the social differences and the restriction of access to valuable information (which is only accessible through payment) leads to a further social polarisation of society.

## Politics

### ■ Regulation (12)

Regulation through politics is decreasing due to an increasing privatisation of state services.

Because of the worldwide network, security of use and possible emergency scenarios are given increased importance. Security policies must ensure security in data networks. However, it remains to be seen how far this will be realised by 2015.

### ■ Copyright, intellectual property (10)

Property or licence rights for knowledge are becoming an important topic (e.g. gene patents) and the handling of intellectual property is becoming a political key decision.

### ■ E-government is reality (9)

The increasing complexity of administration forces an extensive use of ICT. E-government will be widespread in 2015 but will also have met its limits. E-democracy will be an integral constituent of e-government.

## Environment

Here no topics reached a score of 6, although two attain a rating of 5, and are thus excerpted below:

### ■ Ambivalence regarding environmental burdens through the knowledge society (5)

### ■ Sustainability is anchored in society, problem awareness is present (5)

The principle of sustainability is deeply anchored in large parts of the population. Europe has developed into a leading force in the area of development and use of environmental technologies.

## Values

### ■ Medialisation of life (9)

There will be a US-Americanisation of the media: everything that increases market share will be broadcast. There will be a split society regarding media competence and the emergence of even more sector programmes - analogous to the development on the magazine/printed media market. There will be a frequently unquestioned belief in the Internet: 'What is on the Internet is true.' In contrast it was suggested that nothing will be believed any longer, reality is no longer expected behind information. Increasingly, simulation is displacing reality. People lose the ability for face-to-face communication. Access to ICT and telecommunication networks will be free of charge. ICT competence will be defined as a general qualification. There will be a commercialisation and monopolisation of intellectual property.

### ■ Wider definition of work, work-life-balance (9)

'Work' receives a much wider definition and will surpass the classical employment. Work also plays a smaller role in determining status. People increasingly search for a better work-life-balance.

### **Greece**

As mentioned before, the workshops suggested that Greece's present industrial relations and working conditions negatively influence the development of the KS. The educational system is not built around the 'idea' of lifelong education or on a proper knowledge management and creation approach. This results in producing 'less competitive' graduates as compared to other countries. However, various trends are thought possible:

- the development of private non-profit bodies for the provision of higher education will increase competition, which will improve the quality of the education in the public universities and their orientation towards the fulfilment of the market needs concerning specializations and skills;
- the infrastructure that was developed for the 2004 Olympic Games may reinforce the movement to Athens after 2004, which will lead to increasing trans-regional disparities;
- the peripheral disparities in Greece hinder the balanced development of the knowledge society. The large urban areas will be favoured and develop faster because of their improved infrastructure and better human resources, while the rural, mountainous, frontier and islands areas will be even more underdeveloped;
- e-governance enhances transparency in the procedures concerning the relationship between the citizens and the state and contributes to the decrease of the population moving to the urban areas;
- the development of the new peripheral markets (Balkans, Eastern Europe, Mediterranean) alters the orientation of the Greek enterprises. Some of them exploit the cheap labour force, which leads them into being more competitive by reducing the production costs. Others turn to cover the needs of these 'non-competitive' markets by producing goods and services of low quality, which results in the worsening of their competitiveness at European level. These strategies turn the enterprises away from the knowledge society;
- the 'dualism' that characterizes the Greek economy is intensified as the competitive enterprises constantly improve their performances at national and European level, while the 'traditional' and less competitive ones struggle to survive;
- the development of alternative forms of tourism reforms some of the rural and mountainous areas into poles of attraction for tourists and teleworkers and upgrades the quality of life in these areas;
- the 'conservative' organisational culture characterising some areas mainly in Southern Europe results in a widening of the 'distance' between subordinates and senior employees and therefore hinders the diffusion of information and the production of knowledge;
- the absence of the necessary framework for the IPR protection decelerates the development of the knowledge society;
- the increasing ageing of the population affects the ability of the public health system to manage the increasing needs in medical treatment;
- the constantly increasing retirement age in combination with the possibilities for part-time occupation results in the appearance of new forms of work after the age of 60 or 65: part time occupation in the same field or 'alternative' or 'social-voluntary' occupation;
- some people continue working (lifelong working) assisted by lifelong training, while others are excluded from work after the age of 50 for a number of social reasons. This results into the appearance of new categories of employees that are unable to be insured and pensioned;
- the unbalanced 'territorial' distribution of people's ages and incomes affects negatively the balanced development of the knowledge society in Greece;
- the changes in work types and conditions, as a result of the knowledge society, cause changes in the personal life and family structures;

- new social and political movements appear supporting the new living and working types and values, in parallel with new-romantic movements supporting the revival of the old living and working types and values;
- the use of new technologies is restricted by the concerns of the civilians regarding the protection of their personal data (privacy especially at work), the inadequacy of the legal framework concerning IPR protection issues and the tendency towards political control of the information;
- new social and political movements emerge, defending the rights of the civilians for privacy against the abuse of personal data from companies and organizations (to identify preferences of customers, ‘suitability’ for work and education, forthcoming health problems, etc);
- the ‘showing off’ society (anything that is not promoted does not have a value), as promoted also by the mass media, creates consumer models that lead to ‘fictional’ needs and different priorities, which hinder the development of the knowledge society.

### Delphi analysis for three countries

The contribution of the Delphi to the examination of the three pilot countries is hampered by the very uneven response rates for the three countries. In particular, the small number of respondents for Germany means much caution is needed in placing too much weight on the country-specific results.

With this in mind, one simple set of analyses is presented here. Only the results for those statements that are thought to be about right for 2015 by a clear majority are depicted.<sup>29</sup> First, it has been examined which statements are shared by all the pilot countries; then these statements are set out on a country-by-country:

- shared with only one of the other pilot countries;
- unique to the specific countries.

These statements are then summarised to provide a skeletal scenario for each country.

### Common visions

#### Delphi expectations shared by majorities from Finland, Greece and Germany

ID	Category	Statements
2	Governance and mobility	Widespread use of ICT in e-governance enhances transparency in the procedures concerning the relationship between the citizen and the state in my country.
12	Industrial relations	New forms of networked business organisation, that were unknown or very rare at the turn of the century, will now account for a substantial level of economic activity in my country.
13	Industrial relations	A major increase occurs in my country in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work.
20	Living conditions	Lifelong learning becomes widespread with a majority of workers undertaking more than one period of substantial retraining during their working life.
21	Living conditions	Despite social and employment policy interventions, for most workers their work-life balance deteriorates causing rising family stress and conflict.

<sup>29</sup> Note that international respondents from other countries may also have thought specific trends likely or unlikely in the pilot countries, thus increasing the weight given to these topics in Europe at large.

*Finland*

**Visions shared with Greece**

27	Working conditions	Social and policy changes in my country encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities.
9	Health and privacy	Widespread use of telemedicine and online health monitoring systems increases the ability of people with serious chronic and age related diseases to maintain their independence.

**Visions unique to Finland**

1	Governance and mobility	The balance between immigration and emigration in the EU 15 causes the percentage of non-EU15 immigrant workers to more than double by 2015.
5	Governance and mobility	Regulatory authorities take steps to ensure that users are confident that worldwide communication networks are secure against practically all conceivable emergencies.

*Finnish KS Delphi 'scenarios' by category*

**Finnish vision 2015 for governance and mobility**

'Due to the widespread use of ICT in e-governance, by 2015 the Finnish society will have enhanced transparency in the procedures concerning the relationship between the citizen and the state'.

**Finnish vision 2015 for health and privacy**

'There too much uncertainty on topics related to health and privacy in Finland, so there are no clear characteristics of the situation in 2015'.

**Finnish vision 2015 for industrial relations**

'By 2015 there is a major increase in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work. There is also a major increase in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work'.

**Finnish vision 2015 for living conditions**

'By 2015 lifelong learning is widely used with a majority of workers undertaking more than one period of substantial retraining during their working life. In terms of work-life balance social and employment policy interventions do not succeed to decrease stress and conflicts within workers' families. In addition, the bigger reliance on Information and Communications Technologies in working and everyday life increases social isolation and loneliness'.

**Finnish vision 2015 for sustainability and development**

'There is great uncertainty on topics related to sustainability and development in Finland. However, most opinions agree that Europe will be a leading force in the area of sustainable development and the use of environmental technologies.'

**Finnish vision 2015 for working conditions**

'By 2015 social and policy changes in Finland encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities.'

In addition, the widespread growth of a ‘24-hour’ society in Finland leads to a doubling in the amount of unsocial working time’.

#### **Finnish vision 2015 for country-specific statements**

‘By maintaining respectable basic services Finland remains a welfare society in 2015. Furthermore, the Finnish administrative structure undergoes rationalization increasing local democracy and co-operation between sub-regions.

Due to the increased centralization process in Finland population migrates to urban cores and the periphery undergoes negative net migration’.

#### *Germany*

#### **Visions shared with Greece**

6	Governance and mobility	EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations.
18	Living conditions	Harmonisation of educational standards (including certification) across the EU increases trust and transparency in my country’s educational system.
24	Sustainability and development	Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies.

#### **Visions unique to Germany**

8	Health and privacy	Social and political movements concerned with civil liberties have a major influence on government and business. (shared with international respondents)
30	Working conditions	Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to.

#### *German KS Delphi ‘scenarios’ by category*

(Note that these are based on a very small sample of experts)

#### **German vision 2015 for governance and mobility**

‘Due to the widespread use of ICT in e-governance, by 2015 the German society will have enhanced transparency in the procedures concerning the relationship between the citizen and the state. In addition, German regulatory authorities will have taken steps to ensure that users are confident that worldwide communication networks are secure against practically all conceivable emergencies. In the regional context, EU policies are openly used to promote labour market mobility’.

#### **German vision 2015 for health and privacy**

‘By 2015 the Germany society will have increased the ability of people with serious chronic and age related diseases to maintain their independence because of the widespread use of telemedicine and online health monitoring systems’.

#### **German vision 2015 for industrial relations**

‘By 2015 there is a major increase in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work’.

**German vision 2015 for living conditions**

‘By 2015 lifelong learning is widely used with a majority of workers undertaking more than one period of substantial retraining during their working life. Harmonisation of educational standards (including certification) across the EU increases trust and transparency in the German educational system’.

**German vision 2015 for sustainability and development**

‘There is great uncertainty on topics related to sustainability and development in Germany. Germans are confident that Europe will be a leading force in the area of sustainable development and the use of environmental technologies. Increases in wealth creation and quality of life are achieved using proportionally less energy and natural resources than at present’.

**German vision 2015 for working conditions**

‘Widespread abandonment of conventional notions of retirement in my country enable the elderly to continue working if they wish to’.

**German vision 2015 for country-specific statements**

‘By 2015 organisations increasingly realise the high importance of human resources and treat them equal to investments. In contrast, groups of people who:

- a) do not have the requirements for further flexibilisation and ICT use, or
- b) refuse to use ICT

will form the limit of flexibilisation and implementation of technologies, thus affecting their employability.

The question of where stabilising anchors for individuals can be found in the future when the previous ones (workplace, family, regional surrounding) have been lost remains unanswered’.

**Greece**

**Shared visions with Germany**

ID	Category	Statements
6	Governance and mobility	EU policies are used to promote labour market mobility, despite resistance from individuals, trade unions and employer organisations.
18	Living conditions	Harmonisation of educational standards (including certification) across the EU increases trust and transparency in my country’s educational system.
24	Sustainability and development	Europe has developed into a leading force in the area of sustainable development and the use of environmental technologies.

**Visions shared with Finland**

27	Working conditions	Social and policy changes in my country encourage female entry into professional and technical jobs that are currently male-dominated, leading to substantial decreases in gender-related pay inequalities.
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**Visions unique to Greece**

9	Health and privacy	Widespread use of telemedicine and online health monitoring systems increases the ability of people with serious chronic and age-related diseases to maintain their independence. (note: shared with international respondents)
4	Governance and mobility	New technologies and knowledge management methods greatly strengthen the ability of governments and organisations to engage in widespread social control in my country.
14	Industrial relations	A majority of the workplaces in my country in which collective agreements were in place at the turn of the century are covered by individually agreed employment contracts.

*Greek KS Delphi 'scenarios' by category***Greek vision 2015 for governance and mobility**

'Due to the widespread use of ICT in e-governance, by 2015 the Greek society will have enhanced transparency in the procedures concerning the relationship between the citizen and the state. In addition, new technologies and knowledge management methods have greatly strengthened the ability of governments and organisations to engage in widespread social control. .... Greek regulatory authorities will have taken steps to ensure that users are confident that worldwide communication networks are secure against practically all conceivable emergencies. In the regional context, EU policies are openly used to promote labour market mobility'.

**Greek vision 2015 for health and privacy**

'By 2015 Greek society will have increased the ability of people with serious chronic and age-related diseases to maintain their independence because of the widespread use of telemedicine and online health monitoring systems'.

**Greek vision 2015 for industrial relations**

'By 2015 the majority of the workplaces in Greece will be covered by individually agreed employment contracts. Furthermore, new forms of networked business organisation will account for a substantial level of economic activity in Greece. There is also a major increase in the use of electronic networks for remote supervision of new kinds of work (teleworking, mobile working), and new atypical forms of work'.

**Greek vision 2015 for living conditions**

'By 2015 lifelong learning is widely used with a majority of workers undertaking more than one period of substantial retraining during their working life. In terms of work-life balance social and employment policy interventions do not succeed to decrease stress and conflicts within workers' families.

In addition, the bigger reliance on Information and Communications Technologies in working and everyday life increases social isolation and loneliness'.

**Greek vision 2015 for sustainability and development**

'There is great uncertainty on topics related to sustainability and development in Greece. Only one statement was agreed to be right by 2015 but it was not a country-specific issue. Greece is confident that Europe will be a leading force in the area of sustainable development and the use of environmental technologies'.

**Greek vision 2015 for working conditions**

There was striking uncertainty on topics related to working conditions in Greece. Not even one statement was seen as a possible characteristic of the Greece of 2015.



### **Greek vision 2015 for country-specific statements**

‘By 2015 the public educational system is upgraded and restructured (concerning the type of knowledge provided, the way students and professors are evaluated) because of the competitiveness with the other countries’ systems’.

‘By 2015 the attitude towards co-operation and organization is improved and contributing to the creative absorption and management of knowledge within the Greek enterprises’.

‘By 2015 the development of e-commerce decreases the peripheral disparities relating to the access to products and services’.

### **Scenario production and analysis**

The scenarios prepared by the national centres at their second workshops were, in terms of the timing of activities in Euforia (though not in terms of presentation in this report), the first step in the integration of the data from the various streams of work.

Scenario writing is an art in its own right. It was a difficult organisational decision to decide how much guidance to offer to the national centre teams in their preparations for developing scenarios for a KS in their countries with the time horizon of 2015. The course followed is described in the methodological chapters, but in essence the national centres were offered advice but how much of it they used was left to their discretion. The wisdom of adopting this course became apparent in the variety of the processes that emerged in the national scenarios.

The initial framework provided to the national teams involved all teams to begin by proposing three scenarios to their workshops. A skeletal account of the three is as follows:

- a ‘best guess’ extrapolation - this is a vision of the future if generally positive trends persist, if the ‘official future’ aimed at by the political mainstream is achieved without substantial structural change;
- a hard times scenario; where the problems and contradictions of the above model come to the fore, where business as usual results in a declining competitiveness and/or cohesion;
- and a ‘structurally different’ scenario, which in the present study could be seen as encompassing a vision of the knowledge society as marking a paradigm change and thus substantial restructuring of socioeconomic relations - this is liable to be more of an aspirational future.

### **Scenario construction and the KS**

The three pilot countries produced extensively documented scenarios, with rich speculation and discussion about the likelihood of various KS developments, and their implications for living and working conditions and industrial relations. But the types of material produced are rather hard to compare, because of the different practical solutions realised in the three countries.

Germany followed more or less a ‘normative’ approach. After the project team had generated the three framework scenarios, the workshop chose to focus on the most desirable future, examining how this might be achieved (within a single global context). Finland developed three scenarios, but with little assessment of the global context. Greece developed three scenarios and also considered alternative paths of world development. Given these differences, it is liable to be confusing to put the scenarios side by side in any tabular framework.

What we do seek to achieve, in Table 8.1 is to provide a simple list of elements that have received attention in the national centre scenarios. Their different orientations reveal concerns that may indicate a real difference between Finland, Germany, and Greece, as well as just the differences associated with different workshop processes and participants. In the more northern countries there is an obvious concern for social conditions that are less apparent in Greece where the emphasis might be said to be on raising socio-economic capability.

Table 8.1: *Major themes emerging from the national centre scenarios*

Finland	Germany	Greece
1. Unemployment; 2. Social exclusion leading to poverty; 3. Potential labour shortages accompanying demographic change; 4. Lack of entrepreneurship; 5. Lack of labour flexibility and mobility; 6. Polarisation in working life; 7. Regaining an appropriate work-life balance;	1. Economic structure and performance; 2. Social and political circumstances; 3. Living conditions: a) family structures, household composition; b) child- and elder-care; c) domestic division of labour; d) living standards; e) time use; f) work-life balance; g) social and political participation; h) access to public services; 4. Working conditions: a) levels of employment and unemployment; b) skills and training required at work; c) quality of working environment; d) part-time working; 5. 'New' forms of work/ industrial relations: a) strength and strategy of trade unions; b) participation in decision-making concerning organisational and technological change.	1. Exploitation of the natural comparative advantages in: a) services, education and training, health and tourism; b) the 'development engine' is the services sector (tourism-health-culture); c) agricultural sector (integrated management of cultivations, biological-organic, energy cultivations); d) health and the environment related ones (energy, water management, etc.); e) upgrading and modernisation of the educational system and the services provided; f) 'organisation' change in favour of knowledge creation, management, diffusion and exploitation; g) training and lifelong learning; 2. Modernisation of the public sector through the use of new technologies and the promotion of their integration in every-day living involving public services, work, communication and education.

Their different orientations and concerns may well indicate real differences between Finland, Germany and Greece. In the more northern countries there is an obvious concern for social conditions; this is less apparent in Greece, where the emphasis might be said to be on raising socio-economic capability.

### *Finland*

The Finnish workshop provides interesting insights into expectations for developments in the areas of the Foundation's work:

#### **Working conditions**

Results of the scenario analysis process indicate that flexibility will be a very welcomed feature in the knowledge society. It, for instance, enables individual working hours. But there is always a risk that flexibility will not be worker centred, which is a development that should be avoided. Knowledge society development will also have an influence on management systems. Management is going to be more decentralised and less hierarchical.

Results of the scenario process also address the fact that there are some signals that the polarisation process increases in Finnish working life. If Finland's high unemployment rate does not decrease in the future, this will lead to polarisation. This kind of development would mean that those who have work have to work longer hours, but also that social exclusion will increase. This situation would surely not help the labour shortage that Finland will face in the near future as the baby boom generation retires. Another problem of the working life causing labour shortage and dissatisfaction at work will be the increasing stress at work. It increases sick leave, and the stress also induces an ageing workforce to early retirement.

### **Living conditions**

The experts thought that living standard in Finland will remain high. But they saw that in the knowledge society development process there is a major risk that polarisation increases and the income gap starts to widen.

Another uncertainty in the future development will be the lack of work-life balance. Rediscovery of this balance will be very important, and the workforce will, therefore, start to seek new forms of work. If flexible work arrangements and individual work arrangements do not increase, this might cause increased divorce rates and insecurity.

One major technological change in the future may be that the usage of technology will not require expertise. ICT will be user-friendlier and very cheap to use. In fact ICT becomes an element of basic infrastructure of Finnish society.

### **Industrial relations**

The main point of industrial relations that occurred in the scenario analysis process was issues concerning trade unions and labour laws. General opinion was that trade unions are forced to make some strategic changes and their role will be more international. Besides trade unions, new ways of participation will be developed.

The role of the European Union was thought to be in dictating international standards of labour law. Generally, labour laws have to face changes, because labour markets will become more flexible and individual contracts between workers and employees will increase.

### **Germany**

The German workshop, after examining implications of three scenarios for the areas of concern to the Foundation, pointed to a number of policy needs as seen by the experts:

- implementation of the Agenda 2010 defined by the German federal government in 2003 as a first step, bearing in mind that the Agenda's scope is by far too small to affect all areas of society;
- continuation and extension of the reform activities and development of follow-up activities and further activities along the same lines, which need to be implemented consistently and with political courage;
- finalisation and implementation of the federal finance and tax reform;
- comprehensive exchange spanning all parties and interests addressing the strategic issues and visions and paths of reforms of German society.

There are different views as to the mechanisms for such an exchange. Some see a re-launch of the *Bündnis für Arbeit* (alliance for work) in a different format, i.e. as an open forum for all relevant key players to discuss issues at hand without permanently blocking each other, as an appropriate means. Others believe that especially the absence of the alliance of work has been a driver of change and brought some movement into the whole debate.

In order to achieve the above, a redefinition of the role and function and a different self-concept of the trade unions and various associations is required. They should no longer play the role of stakeholders preserving and protecting what they see as key achievements of the past but should become key actors for designing societal reforms and changes geared towards a common vision.

There is the need for an appropriate public awareness and insight into the needs of such a reform where media can also play an important role. This includes the creation of an awareness among citizens but also among all stakeholders and key players in the whole process. One sometimes gets the impression that some stakeholders still seem to be guided in their work by traditional beliefs no longer appropriate as a means to solve today's problems and that citizens have not quite understood the need for reform activities to achieve a functioning and sustainable society in the future.

Action is needed along the lines of the above points for reform instead of an exchange of ever-changing expressions of opinion. The workshop participants felt that a stronger cooperation of government and opposition to overcome the problems caused by the dual parliamentary system could help to faster agree on and implement the necessary changes. Up to now the reforms agreed on or under discussion are rather limited in scope and can only be seen as a very first step in the right direction.

The German workshop also framed its analysis in terms of key social innovations required for Germany to be a competitive and dynamic KS:

- a new political assignment of the three actors: state, economy and civil society. This needs to include more taking over of responsibilities, independence and authority by industry and businesses, but also citizens and NGOs in all areas of society;
- more and new cooperation and control and steering mechanisms spanning all sectors, which can take over responsibility where the state on its own is no longer able to solve problems (or was never able to do so).

### *Greece*

The Greek workshop also outlined implications of scenarios for living and working conditions and industrial relations and suggested a large number of necessary policy measures and social innovations.

The workshop participants considered that existing policies tend to lead Greece to what they termed a 'nightmare' scenario, and discussed new policies to avoid negative impacts and create the conditions for a course to the 'awakening' scenario. The required conditions have to be created not only at the national but at the European level. The Greek polity and society will have to :

- make the changes needed for the 'purification' of the market, the financial environment and the development of businesses;
- increase the flexibility of the labour market and to be able to cover the needs of the market in skills and qualifications;
- reduce public intervention in the economy and to eliminate 'the clientele relations' between the state and businesses as well as the social partners;
- reinforce the impact of the social dialogue and effective cooperation with the social partners;
- create a new regulatory framework to cover 'atypical' work (flexitime, telework, etc.);

- adjust the way knowledge is produced, used and diffused in the educational institutions as well as the enterprises and organizations, according to the characteristics of a knowledge society, so that the demand for further training and lifelong learning comes from the 'basis';
- further support the scientific and technological human resources and to create the conditions that are necessary to attract the business and scientific resources located abroad (Greek diaspora);
- take effective measures to tackle the social insurance problem, the purification and improvement of the public health and welfare system, and the problems related to low birth rates;
- increase the independent structures to control and tackle corruption concerning public money as well as evasion of taxes and social insurance contributions;
- take measures to eliminate 'black labour';
- turn to the exploitation of the natural (static) advantages of Greece and the creation of new anthropogenic (dynamic) comparative advantages;
- place the new technologies in the service of these advantages, in the improvement of the public services and in the increase of quality of life and work;
- take measures for the positive integration of the immigrants and foreigners in the Greek society;
- adopt the concept of innovation (quality differentiation) as a major political target and as a major pre-requisite for development at all levels (state, economy, society);
- increase coordination, evaluation and control of the effectiveness of the measures and actions taken in all policy fields.

Key social innovations will be needed to support the effective implementation of the changes proposed in the policy areas. The most important innovations identified were:

- to develop and adopt a commonly agreed vision for an 'awakened' Greece in 2015;
- to integrate the concept of quality of life in the Greek society, way of living and working;
- to increase the trust and collaboration between the public and the private sectors, the state and the citizens. To exploit the power of the media for this purpose and for 'awakening' the Greek society;
- to upgrade the social partners to represent the new forms of work and employees;
- to combine the principles of the free market and those of the private and public social responsibility in rationalising and improving the function of the economy;
- to strengthen the social dialogue role and the active participation of the societal organisations in policy formulation and decision-making processes;
- to create the necessary framework and structures for the promotion of the collaboration between the entities of the polity, the economy and the society;
- to allow for new movements to appear, which promote social responsibility, quality of life, diversity and multiculturalism.

Finally, the following areas need more knowledge and research so as to facilitate social innovations and consequently enhance the effectiveness of the proposed policy measures and changes:

- to identify the natural (static) and anthropogenic (dynamic) advantages of Greece and how these can be exploited in the course to the knowledge society;
- to explore how and what new technologies can be set to serve these advantages;
- to explore what new skills are required for the ‘Greek model’ of the knowledge society;
- to examine the new organisational structures needed in the ‘Greek version’ of the knowledge society;
- to examine the spatial and regional dimension of the measures that should be taken;
- to carefully study the current position of Greece and the reasons for being here (major trends, drivers, suspending factors for development, etc.) along with the weaknesses, the strengths, the opportunities and the threats from the wider European and global environment.
- benchmarking, exchange of experiences and identification of good practices from other countries / regions.

### **Scenarios and knowledge society foresight**

The scenarios reveal interesting national features. For example, in Germany it was argued that the emphasis of education ought to be changed. In Finland, it is entrepreneurship that ought to be fostered. In Greece it is strong policies for social change that ought to be put in place. From the policy ought the next step is to identify the policy instruments according to those issues that lie outside national control, those where there is partial control and those where national control is possible. From these alternative strategies should be constructed. If the first purpose of scenarios is to shift perceptions, the second is to enable alternative policies and strategies to be conceived taking conflicting issues into account rather than allowing one policy instrument to negate the effect of another to create a zero sum situation.

Use of scenarios enabled the national centres to construct plausible notions about the way that a KS might develop in each country. In terms of sampling the territory of the future, there were far too few probes to do more than appreciate that the terrain of a KS is very fuzzy, is complex and is a social system far from equilibrium. Scenarios are not models and it would be wrong to believe that there is a model for an advanced country as opposed to those that are less advanced. Indeed, it is unlikely that there will be a ubiquitous model of a KS, as cultural matters are likely to intervene. It is more likely that KS will be unique to each country; common underpinning features will be apparent in all countries (and probably these will continue to be developed to different extents across countries). The scenarios reveal indications of both common and specific elements.

### **Knowledge society varieties**

Figure 2.1 has been reproduced and amended below as Figure 8.2. The various analyses of this chapter have demonstrated that in terms of KS indicators, the three pilot countries vary markedly, and in many ways appear to be on a continuum of development. But in other respects, as elucidated by the Delphi and workshop analyses, they are more diverse than this suggests.

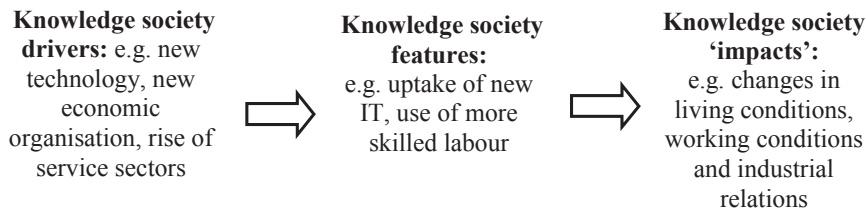
The revised framework is one in which a number of key considerations derived from the analyses have been included:

- the ‘drivers’ of the KS are seen as a number of developments - some technological, some social and organizational, that are changing the opportunities for action;
- the opportunities can be perceived and grasped to different extents by actors in different circumstances, with different resources and capabilities;
- the ways in which these opportunities are grasped interacts with the previous circumstances - and with the choices and circumstances of other actors (e.g. countries) - to produce local manifestations of the KS;

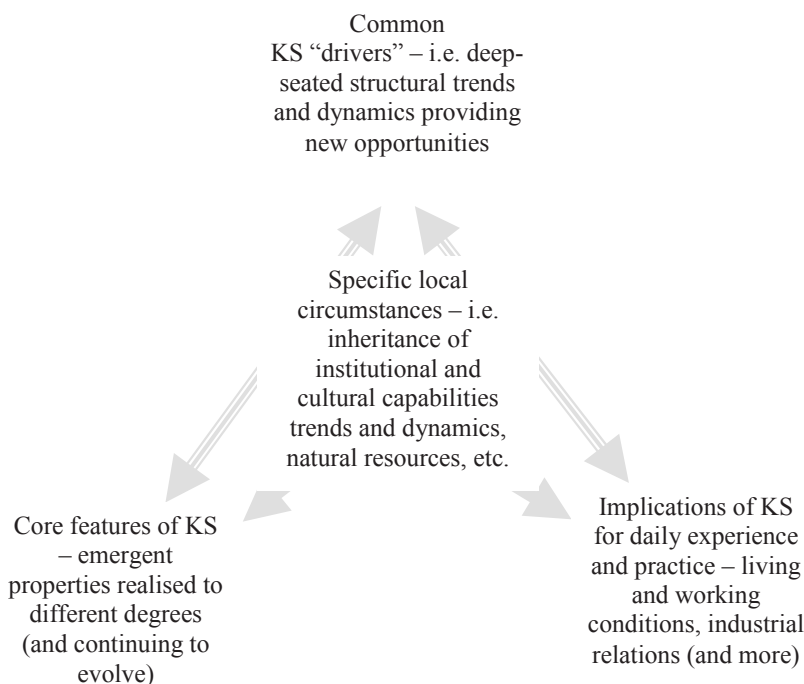
- these core features of the KS are experienced by individuals and social groups in various ways, which are mediated by local circumstances, and by the activities and choices of these actors;
- the structure of the KS in specific cases, and the implications that this has for social affairs (such as the three areas of concern to Foundation), can influence the so-called drivers. For example, organisational techniques and technological development may be influenced by levels of uptake and the lessons learned from implementation of these new opportunities. Indeed, perception of what these opportunities are, and efforts made to further understand, develop and implement them, are liable to develop through such interaction;
- one consequence of this is that in practice there is liable to be considerable blurring of boundaries between ‘drivers’, ‘features’ and ‘impacts’. Each of these categories overlaps with the others, and some phenomena may move from one to the other. The original framework is a useful starting point for structuring analysis, but in practice those using it - statisticians, workshop participants, etc. - are liable to continually challenge its limitations;
- the EU is liable to feature a wide variety of knowledge societies - though there may be regional variations as well as cross-national ones (and it is possible that some regions in quite different countries will have a great deal in common). This does not mean that it will be impossible to speak of the European KS. The specificities of Europe are liable to yield very different models of KS than those displayed in North America, South East Asia, etc.

Figure 8.2: *Reviewing the framework of knowledge society development*

From:



To:

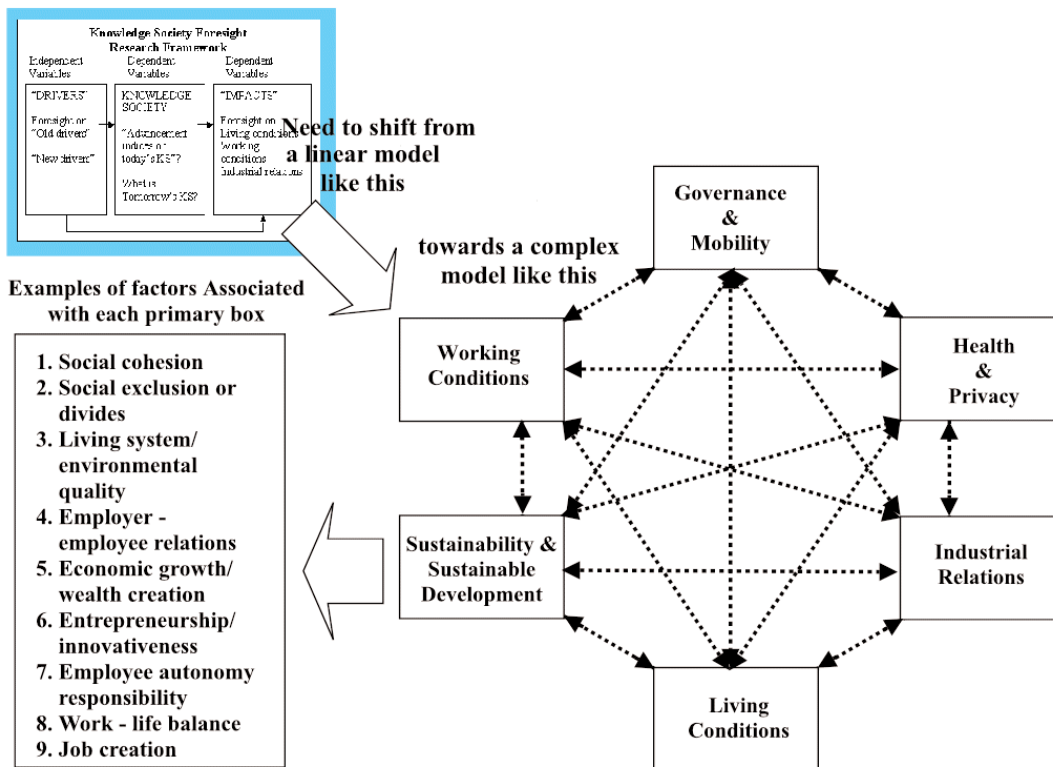


## Synthesis

Figure 8.2 presents a framework for the knowledge society that drew especially on the results of the national contributions to Euforia, putting emphasis on local circumstances, capabilities, and choices in shaping the KS that is emerging in the EU and in its Member States.

One might go further and suggest that the ‘drivers’ - ‘features’ - ‘impacts’ framework, while methodologically very useful in Euforia, is still too likely to give rise to linear ways of tackling the issues. Figure 9.1 illustrates the sort of more complex model required to explore the implications, for Foundation concerns, of the complex, emergent nature of a KS. The model reflects the approach presented in Figure 2.2, and is exemplified with the categories that Euforia developed to tackle these concerns.

Figure 9.1: A more comprehensive framework for thinking about the KS



Current debates about the KS have never been able to escape from their entanglement with the current fascination for new IT. Certainly, IT will be an enabling technology for the emergence of a KS, since it can be applied directly to information-processing tasks required for knowledge production, reproduction, and application. But other technologies<sup>30</sup> are also important sources of forms of knowledge that are enabling changes in social life - and influencing many areas of the Foundation’s concerns in significant ways.

<sup>30</sup> For instance, nano-science and technology, genomics and proteomics.



Only a limited probing of the terrain of a future KS could be made in the Euforia project. However, throughout the probing has repeatedly returned to what might broadly be called the problems of living.

Typically, the problems of living are influenced now more than ever by global events; every home in the EU 15 is affected one way or another by technological, political, cultural and social developments in previously distant world regions. There is little reason to suppose that the EU 15 or any other nation will be able to inhibit, for its own (purported) benefit, the globalisation of knowledge. Other regions of the world - and not just North America and Japan - may well become major contributors to the emergence of KS within the 2015 time horizon. Their social and organisational models and innovations, not to mention their cultural contributions and political preoccupations, may well enter the mix and be influential in the West - just as they are now influencing the technological and economic elements of our current KS developments. (Consider the current 'outsourcing' / 'offshoring' discussion, as major elements of some service industries are migrating, on the back of increasingly powerful, low cost communication systems, to other parts of the world.)

### **The knowledge society revisited**

In the final section of this chapter the main threads of the Euforia project are drawn together to display some possible characteristics of the terrain of a future KS. As such it has to carry a warning that the probing of the project has been very limited by its nature as a pilot study. What is set out is in the form of a straw man to promote discussion rather than to give any indication of steps that need to be taken or decisions that need to be made. The project team warn against any deductions of the latter kind.

The most obvious feature to emerge is that neither the terrain of a KS of the kind examined in the Euforia project, however, nor the more restricted form of knowledge-based economy indicated in the Lisbon declaration, is likely to serve as a good characterization of the EU by 2010. The role of formal foresight programmes in the emergence of a KS has yet to be established. The Euforia project may turn out to be a forerunner in this context.

The nature of a KS remains elusive, as befits an emergent phenomenon. The study has been able to identify a number of common themes that underpin notions of the KS including:

- the growth of the service economy and information society;
- the increased significance of innovation in social as well as economic affairs;
- the application of knowledge about knowledge (in terms, for example, of efforts to build 'learning organisations', to measure and manage 'intangible assets', and to improve decisions about priorities in research and education).

These factors are liable to be mutually reinforcing. This framework only probes the terrain very coarsely, but does not provide a detailed map or model of a KS.

However, it has been possible to benchmark the current status of KS through the use of an eclectic set of indicators to measure their value in the EU 15 and to compare these with the corresponding set in the US and Japan. In developing this approach the dialectic between conceptual and empirical analyses is likely to provide the most fruitful way of developing an understanding of a KS. The indicators set was divided into those that were thought to be likely prerequisites of a KS and those that reflected their outcomes. A large set of indicators was developed to cover the EU 15 countries and, where possible, other world regions:

- A striking correlation between most of these indicators, at the national level, was apparent. Countries high on one indicator were also, typically, high on others.

- A benchmarking analysis of key indicators also shows how very unevenly the three pilot countries are currently positioned with regard to the eclectic set of KS indicators used. Though there are few relevant indicators where time-series and dependent trends can be depicted, it seems that movement toward a KS is taking place at an uneven pace across the EU. For the immediate future, at least, the prospects of convergence in the set of indicators listed previously seems to be uncertain at best.
- In the three pilot countries the outcome of all aspects of the study cautions against assuming that there is a simple pathway to a KS, with countries standing at one or other step on the staircase. While many features of a KS are shared, as shown from the Delphi study, there is also a strong sense of individuality in the way each pilot country responded to the notion of a KS, as was evident in the national scenarios. It was not felt to be inevitable that a lagging country should necessarily emulate the practices of a leading country with respect to, for instance, Internet or mobile phone use.
- Consequently, we need to be cautious about seeking to create a single model of a KS that can be universally applied, say, in the terms of the Lisbon Council's declaration. European KS may differ among themselves just as industrial economies or welfare states do. Indeed, there may well be substantial diversity at sub-national levels, between European regions and social groups.

From the above, the retention of subsidiarity at many different levels is probably a key factor (among others that are not part of this study) in the development of a KS among the EU Member States.

A number of issues have been identified where progress in the direction of the Lisbon declaration is to be found. Many European countries are displaying features of a KS in many ways, such as high levels of IT use, dominance of services in many areas of economic life and a growing emphasis on innovation. Other topics, such as knowledge management and the creation of learning organisations, seem to be much more unevenly developed. However, there are frequently gaps between the situation in the majority of EU Member States and the performance of the United States. Europe may have an emerging KS, but it is evidently not the most dynamic and competitive one.

There is considerable agreement about some of the contours of the evolving KS in Europe: these are indicated from the Delphi study, for instance. Many of these attributes of the KS go beyond the simple techno-economic dimension. In the latter, progress is widely anticipated as a necessary precursor to many aspects of a KS in the EU. However, some other aspects of change are thought to be much less feasible in the medium-term future, and yet others are seen as uncertain, meeting with very mixed responses among expert opinion

Issues relating to the Foundation's special interests of living and working condition and industrial relations (LC, WC and IR, respectively hereafter), are no longer local matters to their countries or even the EU. They are being influenced increasingly by a wide range of global events and trends. Examples are:

- the employment influences arising from globalisation in the form of 'offshoring' of jobs;
- the reappraisal of traditional notions of civil liberties and personal privacy arising from the use of new technologies and, especially, from efforts to deal with terrorism and other new security and criminal threats;
- the influence of globalisation on industrial, environmental, and other areas of law.

Furthermore, the study highlights the importance of a range of social and institutional factors in the construction of a European KS. It emerged from the national scenarios, as well as concerns expressed in the various workshops, that the nature of the KS may vary considerably across the EU because of different social dynamics in different countries and

regions. Such diversity is possibly a strength that should be retained through strong subsidiarity, rather than a liability reflecting simply relative advance and backwardness among member states.

The study also points to several ways in which a KS may evolve with undesirable features unless appropriate policies and strategies are developed. In each of the countries examined, institutional factors and relations between citizens and the state, and citizens and the economy, were seen to be prominent and often problematic influences.

Some improvements in living and working conditions and industrial relations are likely to occur as a contingent feature of KS development. But the project also indicates that the emergence of a KS should by no means be taken to imply automatic alleviations of the sorts of problems that Foundation was established to deal with. Certain problems may well be intensified. Euforia has shown that foresight approaches can help to identify some of those that are on the horizon and to explicate some of the dynamics behind these developments.

Participants in the project workshops had the opportunity to discuss and share their impressions about some particular indicators and relationships between different aspects of KS within their own countries. There were lively discussions about influences in different regions, including the context of accession countries, but it was not possible to record these with sufficient veracity to take them further. To take this discussion further (or even to focus on accession countries) with an explicit focus on notional variations in a KS across Europe would help to understand what underpins them and whether these represent opportunities or problems for the EU.

In conclusion, here are some results from the Delphi study. Continuing the mapmaking analogy used earlier in this report, the Euforia Delphi survey probed a number of specific developments that workshops and other study activities had suggested might be important features of a KS. The Delphi questionnaire was rather like a series of probes launched into a number of discrete areas of the huge and largely uncharted mass of a KS, to sound the opinions of the participants concerning the specified areas of this uncharted continent. While the probes were only a fraction of those that might have been considered, they revealed interesting contours and structures in a KS as shown earlier in this chapter. However, the project team were disappointed by the exclusion of topics dealing with classes of knowledge as genomics and nanotechnology, and more cultural, social and organisational practices, which are relevant to the Foundation's areas of work.

Though the Delphi study involved a relatively small number of participants, it nevertheless is striking that they agreed on a number of major aspects of what a KS might look like by 2015 and also shared views about the influence of these on living and working conditions and industrial relations. Specific features that appear to be strongly reinforced were:

- economic growth/wealth creation;
- entrepreneurship and innovativeness;
- and social cohesion.

Positive developments also appear likely for job creation, while the goals of sustainability and environmental quality, as well as employee autonomy and responsibility at work were also supported, but more equivocally. KS developments were seen as having limited or mixed influences on employer-employee relations, social exclusion or divides and work-life balance. The implication is that improvement in these respects is by no means an inevitable consequence of KS trends.

To summarise a few of the Delphi conclusions: It was expected that lifelong learning would become widespread, with a majority of workers undertaking more than one period of substantial retraining during their working life. It was also

strongly anticipated that Europe would develop into a leading force in the area of sustainable development and the use of environmental technologies. Participants anticipated a substantial decrease of gender-related pay inequalities flowing from social and policy changes designed to encourage female entry into professional and technical jobs that are currently male-dominated, a trend that will improve industrial relations. New forms of networked business organisations were anticipated to grow with some positive effects on economic growth/wealth creation and entrepreneurship, and innovativeness, but uncertainty about the effects of this trend on employer-employee relations. A rather similar pattern of influences was seen as associated with another widely foreseen trend, a major increase in the use of electronic networks for remote supervision of new kinds of work. Widespread use of ICT in e-governance was also anticipated with benefits for social cohesion and sustainability/environmental quality.

Some other developments that were widely anticipated had less, or less positive, influence. In particular, and echoing the ambiguous influences noted above, it was widely felt that most workers were likely to experience deteriorating work-life balance. The likely outcome would be rising family stress and conflict, with the likelihood of an adverse effect on social cohesion, employer-employee relations and work-life balance accompanied by an increase social exclusion and divides. There was much uncertainty about other influences.

In addition to the trends that were widely anticipated to apply to a KS in 2015, the study identified a number of developments about which there was much less agreement and a number that were felt by the bulk of respondents to be overstating the situation by 2015. Many of the latter topics concern workplace, employment and industrial relations issues. The general expectation that these trends would not be realised by 2015 reflects widespread scepticism that institutional arrangements will be adapted along the lines that KS commentators suggest. For example that:

- trade unions will be able to develop better strategies and achieve political influence;
- network and learning organisations will be the norm;
- ethical practices will prevail at the workplace;
- social inequalities would be tackled seriously.

These suggest that KS is far from a utopia. The focus has been on Delphi results here, but similar concerns are raised by the workshop studies.

The upshot of this, in terms of the hypothesis of the knowledge society, can be summarised as follows:

- the concept of the KS forms a fruitful way of addressing important ongoing changes in the EU;
- as an hypothesis about the nature of these changes it is valuable in directing attention to critical elements, suggesting relevant indicators and methods of analysis, etc.;
- however, in most formulations of the hypothesis, there seem to be substantial gaps and lacunae, especially about the more problematic social features of the KS;
- these gaps may well imperil efforts to realise the normative hypothesis of the KS;
- this aspirational hypothesis that the EU can rapidly become the world's most dynamic and competitive KS seems to be less well-supported. The EU has real strengths that should be valuable for the KS, but it is lagging on many indicators, and some countries and regions seem to be severely disadvantaged;

- more attention is required to the social features of the KS that may contribute to this problem. Some of these features may be impediments to KS development - fears about the nature of the KS, that imply scope for policy interventions might be required to move developments in the directions specified while mitigating any social costs. Some social features can be better seen as opportunities - for instance the building of social capital, and the effective use of that capital which now exists, is required to underpin the more technical features of the knowledge-based economy, so that a true KS can be realised.

This part of the report explicates the main foresight methods employed in Euforia and outlines important decisions that had to be made as how to deploy them. Detailed information and the outcome of the individual steps can be gleaned from the appendices that focus on the different methods. Here, we present more succinct statements of the implementation of the various methods used with two purposes in mind. First, we need to be clear about ways in which the synthesis results presented above are shaped by the methodological decisions that have been made. Second, the lessons learned for future foresight work on the KS are developed. The section also includes a general listing of the:

- contribution that can be made by foresight methods for approaching KS issues;
- ways in which these methods can be effectively implemented.

The section begins with a brief summary of the organisation of the work, and how the various elements were interrelated in practice.

## The Euforia jigsaw

The knowledge society is a complex notion, and the Euforia project itself formed a complicated jigsaw. Various components had to be pieced together across three different Member States of the EU that were:

- widely separated geographically;
- of very different cultures and national histories;
- of very different languages - with all that involves in grammar, nuance and script.

In addition, the national centres that formed the working partnership, while being experienced in foresight work, were familiar with different methods and styles of such work. This experience was grounded in different contexts of debate and practical application. These 'path-dependent' individual approaches to foresight inevitably reflected the implementation of the allotted tasks, where much of the realisation of foresight is more a matter of tacit knowledge than of steps written down in detailed rule books. Furthermore, of course, the teams had their own management styles, reflecting the size and nature of their parent organisations, as well as cultural and disciplinary differences.

It should be borne in mind that the study was organised as an exploration of KS developments based on soundings of three very different EU Member States (Finland, Germany and Greece). These were believed to represent different levels of development toward a KS. The notion of 'levels' of development may convey the expectation of a common or harmonised form of KS throughout the EU. But this is an hypothesis. It was essential to grant as much freedom as possible to the three national centres, within the general structure of the study programme, to test this major assumption. The outcome of this test is described in Part II.

The jigsaw that had to be managed - daily and mostly by electronic communication - is sketched out in Figure 10.1 below. Figure 10.2 depicts the time frame and planning of the project. Throughout the main focus of the programme has been to help to inform the Foundation's own processes of priority setting. As can be seen from the diagram, the internal organisation of the Euforia project drew on the lessons of earlier foresight studies. However, all foresight studies depend heavily on the exercise of much tacit knowledge of the processes that link the various formal methods together. The Euforia project was no different in that respect.

The general flow of the programme, used for project planning is illustrated in Figure 10.3, where the sequence of the key methodological steps used in the project are indicated by the shaded boxes. Finally, Figure 10.4 graphically presents how the elements of the project were brought together into the synthesis presented in the preceding chapters.

Figure 10.1: Components of the Euforia project

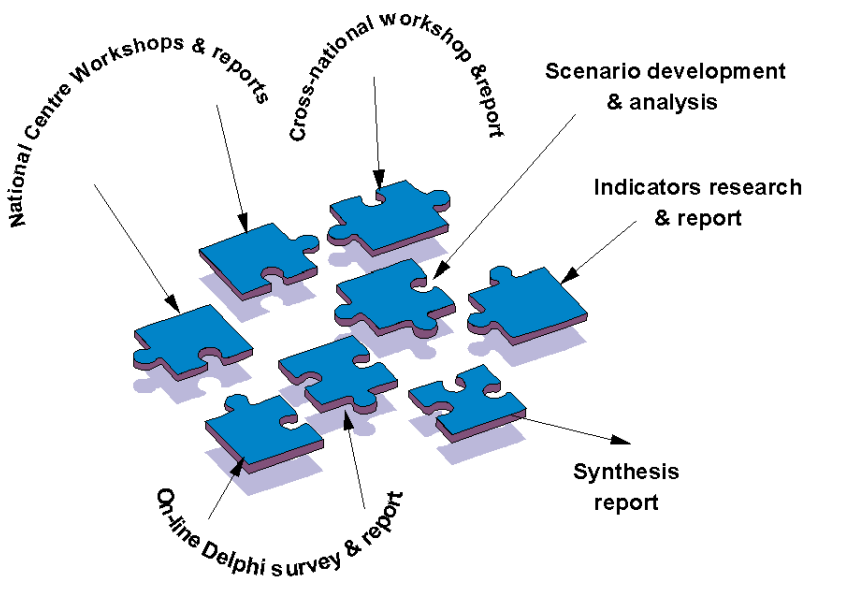


Figure 10.2: Timelines for the Euforia project

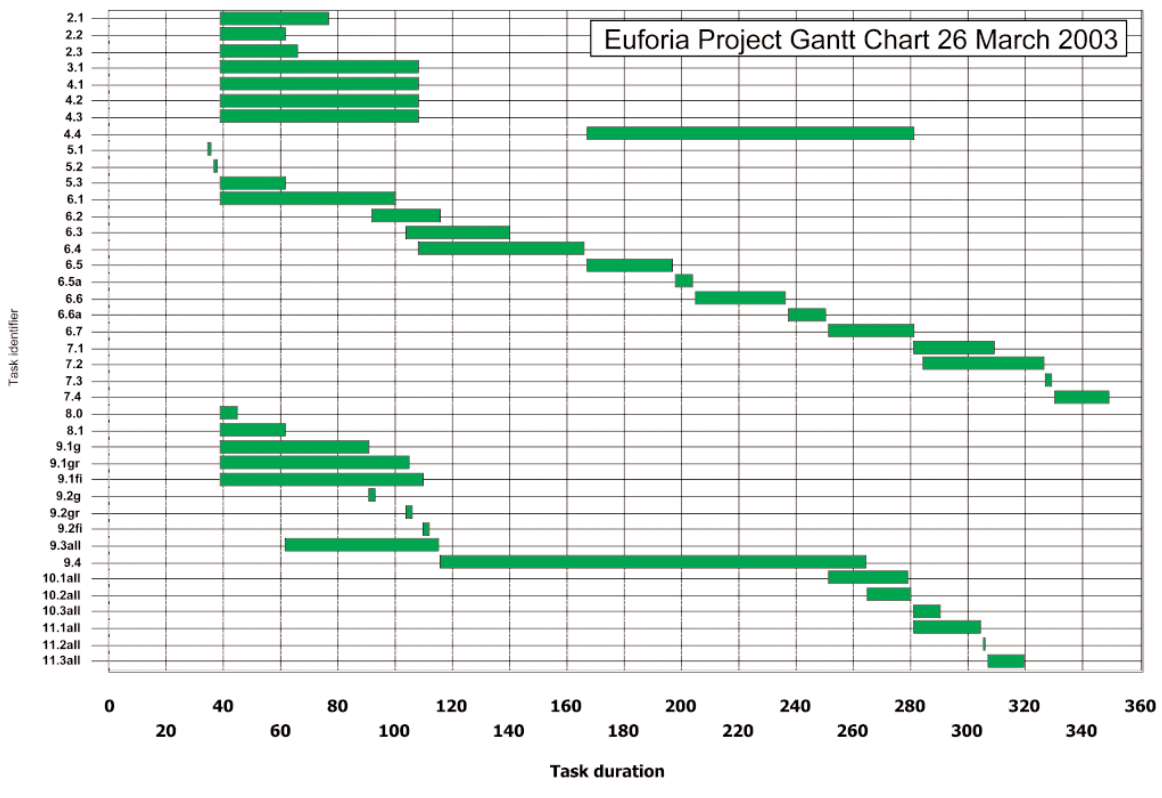


Figure 10.3: Stages and process in the Euforia project

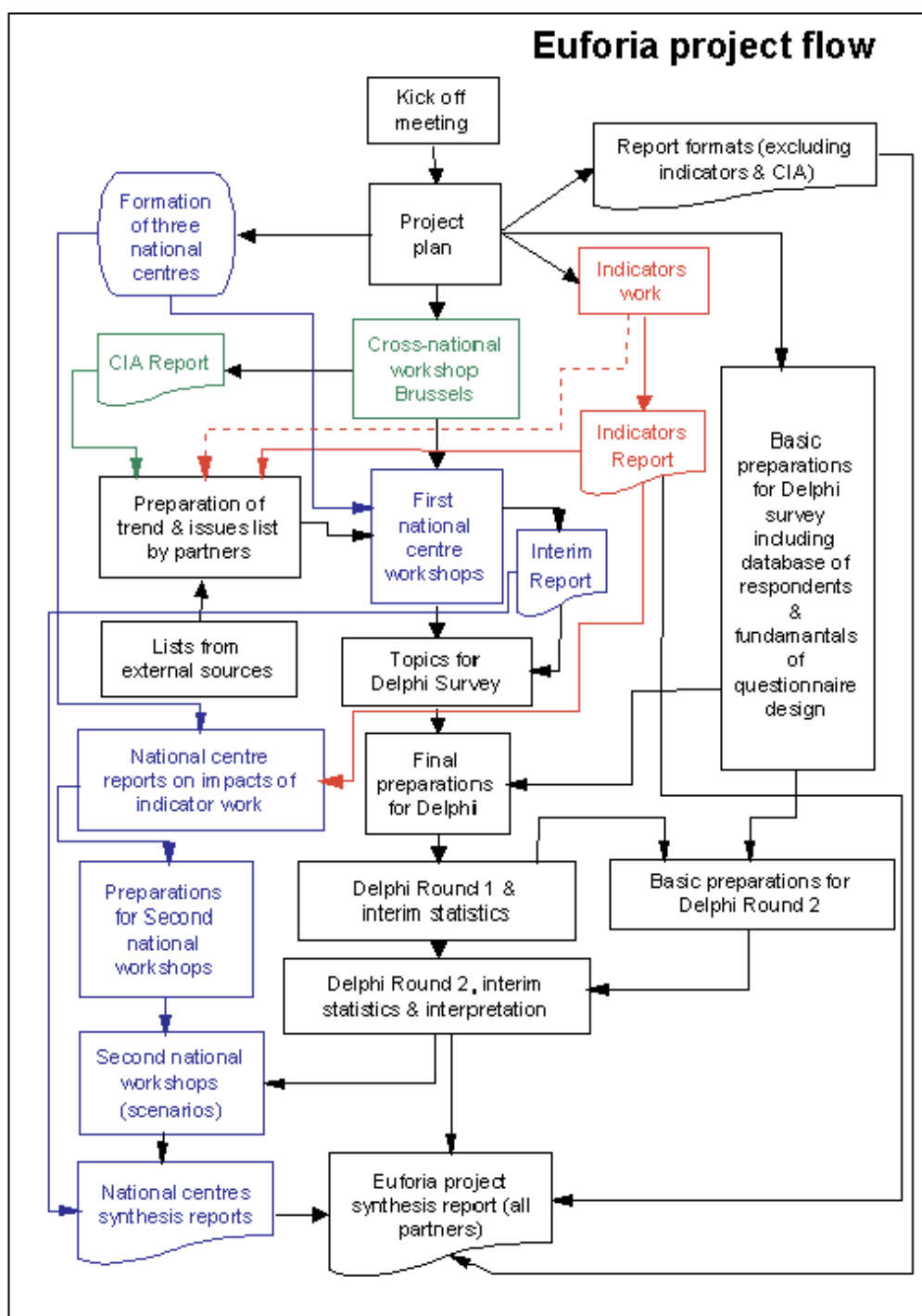
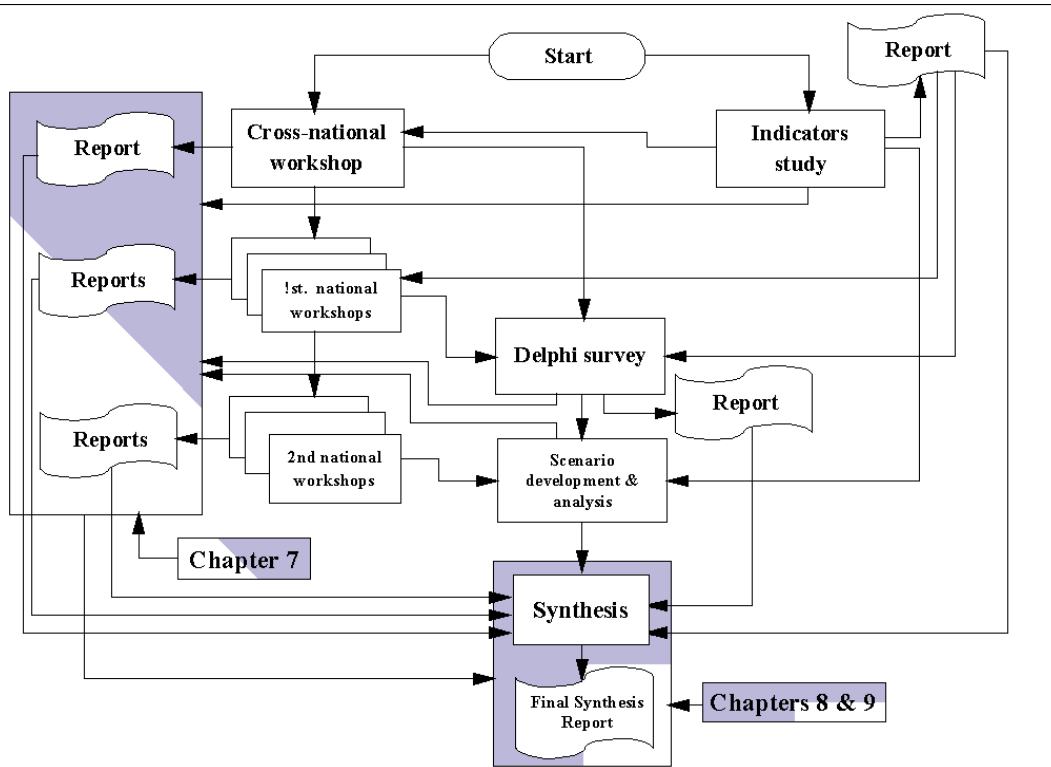




Figure 10.4: Synthesis of material - a flow diagram



## The indicators study

The indicators study benchmarked the current (2003) state of emergence of a KS in the EU 15 by comparison with the US and Japan. Throughout it needs to be remembered that the benchmarking has been on the basis of an eclectic set of indicators that:

- may or may not be the prerequisites of a KS anywhere or even currently;
- an appropriate set of indicators for 2015 may bear either only a partial resemblance to the present set or no resemblance at all.

There are numerous statistics that could be brought to bear on the measurement of a KS. In Euforia, Empirica provided a high degree of expertise through their participation in European projects such as SIBIS and STAR. Empirica are among the most experienced researchers in this field in which they have amassed a considerable volume of data. The indicators study is described in full in a separate volume of appendices.

Through a series of presentations in the course of the project, Empirica were able to:

- discuss their indicator studies;
- accept criticisms of existing data for the present purpose;
- where feasible, to accept proposals for alternative statistics to use.

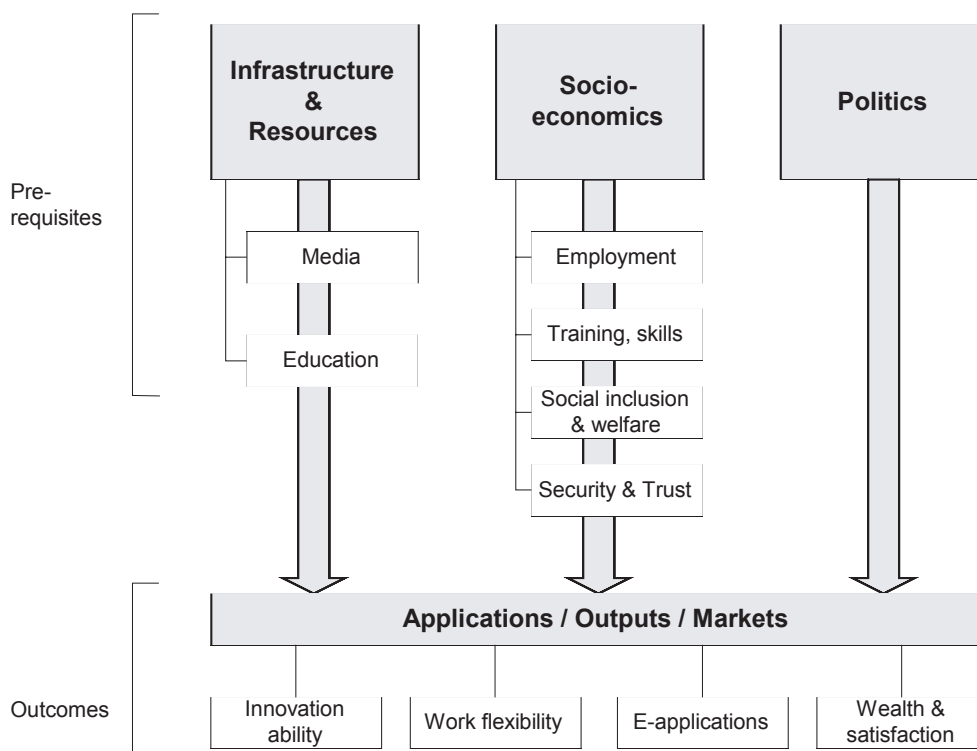
The data they supplied was an important input to the workshops and to comparative work between countries to establish their relative positions in 2003 in the development of a KS.

The data used were largely drawn from official sources, such as Eurostat, OECD, and UN organisations, since these are most likely to be comprehensive (especially in terms of the number of countries covered) and reliable (in terms of sample sizes, etc). Other data came from the SIBIS project (Statistical Indicators Benchmarking the Information Society: <http://www.sibis-eu.org>). In 2002, SIBIS carried out a large-scale representative survey of the population in all 15 EU Member States, the US and Switzerland and a survey of decision makers in companies in Germany, France, Italy, the United Kingdom, Spain, Finland and Greece examining information society developments. The topics considered contribute substantially, if not comprehensively, to the analysis of KS.

In Euforia, following initial discussions of the nature of a KS, appropriate indicators were searched for and if or when located, they were sorted by whether they measured a prerequisite for the advancement of a KS or whether they measured the outcomes of a KS already in existence. A finer differentiation was then made (see Figure 11.1) in which the prerequisites were divided into:

- infrastructure and resources, containing data on media penetration and education;
- socio-economics, containing data on individual requirements such as employment, training and skills, and relevant socio-economic issues like social inclusion and welfare; and security and trust;
- politics, containing data on governmental involvement in the development of the knowledge society.

Figure 11.1: *Conceptual framework for knowledge society indicators*



The outcomes were divided into:

- innovation ability, measuring patent applications and R&D expenditures;
- work flexibility, containing data on flexible working arrangements such as telework;
- e-applications, such as e-commerce and e-health, containing data on usage and usage barriers, as well as digital literacy;
- wealth and satisfaction, containing data on economic wealth and individual attitude towards work.

Indicators dealing with media and their usage were:

- further divided into ICT-related indicators;
- traditional indicators. These relate to the ongoing diffusion of IT. Although widespread, IT has to date covered only a part of the media landscape and is still not available to all citizens, and companies. Also, there are still considerable differences in the content provided by, for example, the Internet and TV.

The indicators report provided detailed data on a range of topics such as an overview in the areas of IT and internet access; education participation and attainment; IT and education; training; self-directed learning; the digital divide; innovation ability; telework; and digital literacy. Country profiles were produced for the three countries studied, alongside EU aggregates and overall comparisons of the EU countries. To facilitate comparisons on most indicators, results were presented in a standardised form (i.e. results were calculated relative to the EU 15 average).

### **Implementing indicator analyses in knowledge society foresight**

The obvious lessons of this study are that it is important to make use of indicator analyses in foresight studies even if these may sometimes need to be complemented by fresh benchmarking or statistical activity. The costs of data production cannot be underestimated, so it is important to develop, as was the case in Euforia, a good working relationship and interchange of ideas with experts in indicator development and use.

It is particularly helpful to have timely reports on indicator analyses for the various working groups of foresight projects. Systems should be developed to capture and build on the ideas for new indicators and further analyses that emerge from such groups. In the course of the Euforia project, several ideas for new indicators and analyses were developed that might bear further attention. One suggestion was for indicators that might capture organisational developments such as downsizing and 'flattening' of bureaucratic structures, perhaps by means of analysis of occupational statistics. Data from sources like the Community Innovation Survey can be used to chart the knowledge-intensity (employment of graduates) of different types of firm and economic activity. Indicators might be clustered to give an idea of different paths of development. For instance, Ireland's heavily foreign investment-based path of development as opposed to one derived more from endogenous resources. In this study Empirica was able to listen to numerous suggestions and acted on many of these, but some more systematic capture of discussions or even foresight processes involving statisticians themselves, to envisage future statistical requirements, could be rewarding.

A particularly important lesson for the future is that advancement indicators, as they were called in the study, can be beguiling in seeming to set a framework for a KS. If there are key features that are widely agreed to be elements of a KS, and if these can be plotted over time intervals, then it becomes possible to measure retrospectively their rate of change. By inference this rate of change may reflect the rate of advance of different countries, regions or social groups toward a KS in terms of the chosen set of indicators. How the set of indicators is chosen, then becomes an important matter. For instance, to take a techno-economic feature, penetration of the Internet could be taken to be a key feature.

However, this does not mean that every KS, now and in the future, will necessarily rely on the Internet, as we now know it. For example, France attempted to develop an information society based on Minitel, in the 1980s and there are other ways in which wide-scale interactive communications can be created using the power of IT. Whether the Internet and the Web will still be a key feature of a KS in twenty years time is anyone's guess; it is likely that over the coming decades there will be substantial changes in the protocols and services that are used for online communications.

The above point underlines three issues:

1. indicators are likely to be only specific, concrete operationalisations of underlying concepts - in this case, something like connectivity or connexity<sup>31</sup> - and at different times different measures may be required;
2. it is easy to be bewitched by specific technologies and social practices, when these may be best seen as contemporary manifestations of underlying trends that can and probably will take different forms in the future;
3. there is the question of measurement. If the indicator is to do with penetration of the Internet, then questions arise over how this is to be measured. Is it to be access to facilities and networks? Actually having used the services? Amount of time spent online? Presence on the system via email addresses, web pages, etc.? In any case, once we have chosen the indicator, can it reveal how it compares across different countries - for instance, how countries A, B and C vary in terms of the levels of use of the Internet recorded in surveys of the population or of businesses.

## The workshops

In common with many other studies, workshops were a major feature of the project: there were seven in all. The cross-national workshop was the first and was held at the beginning of the project in November 2002. As will be seen it had a different character to the remaining national centre workshops, held in January and June 2003. There were two sets of three national centre workshops each set having a defined purpose as described below. Full descriptions of the workshops are given in the individual reports (appendices report).

### The cross-national workshop

In the cross-national workshop the opportunity was taken to enlist the participation of experts and stakeholders attending the Foundation's conference on 'European knowledge society foresight - the Missing Link between Technology foresight and the Lisbon Objective?' Erkki Liikanen, European Commissioner, made a keynote presentation to the wider conference on behalf of the CEC's DG Enterprise and Information Society, on the challenges that a KS poses to European competitiveness. The Foundation's work on a KS, including the handbook of knowledge society foresight and early work on Euforia's indicators study, were also presented at the conference. All of these topics were commented on by discussants.<sup>32</sup>

<sup>31</sup> Cf G. Mulgan (1997) *Connexity: How to Live in a Connected World*, London, Chatto and Windus.

<sup>32</sup> A detailed account of the conference, and summary of presentations, is provided in T. Kauppinen (2002) *European knowledge society foresight - the Missing Link between technology foresight and the Lisbon Objective?*, Dublin, Foundation Conference Report (mimeo). The workshop methods on which the present synthesis draws are described in chapter 12 of that report, by I. Miles and R. Popper: 'Important Trends, Drivers and Impacts of the Knowledge Society: The Euforia Cross-National Workshop Results'.

The cross-national workshop took place during and after these presentations. It was intended to:

- provide cross-national perspectives on the topics that Euforia was to take up from a national basis in three countries - to raise issues for these national studies, to act as a *sounding board*;
- introduce participants (some of whom were to be involved in the national activities) to the sorts of method used in foresight studies, and thus to exemplify issues outlined in the handbook - in other words to act as a *demonstrator* of KS foresight methods and thinking;
- explore the sorts of problems and considerations that need to be taken into account in applying foresight methods to the KS concerns of the European Foundation - to be a *prototype*.

The workshop drew on people from many EU countries, as well as from different stakeholder groups and specialist in areas of concern. Participants were instructed to take the next 15 years as the time horizon they were to discuss. If any factors were expected to rise and fall in importance over this period, they were to try to think in terms of the average or typical influence or pattern of development over the period. They were also asked to consider the future of the EU 15 as at the time of the workshop there was still uncertainty about how many countries would join during enlargement and when the accession dates would be.

The workshop used various methods that are often used in foresight workshops, tailored to the specific interests of the Euforia project. In the central process, participants were asked to:

- identify and analyse drivers of change and important factors that influence a KS;
- discuss and systematise the implications of these drivers for the primary areas of concern for the Foundation.

The process yielded lists of factors and topics, and hints as to issues that should be examined; these are reported below. However, it should be stressed that a major role of such methods is to provide a structured context for discussion in small groups. The methods should:

1. push participants to share knowledge, breaking out of their standard ways of presenting and absorbing inputs;
2. give the participants a taste of some of the methods used in foresight;
3. give insights into how such methods can be used to understand better the interrelationships between different elements of a KS.

There are many alternative ways in which foresight methods can be implemented. The particular approach used will depend very much on the context involved. The workshop demonstrated such methods, rather than being a definitive approach.

A series of break-out groups were facilitated by Euforia team members as follows:

### **Break-out 1**

The first task was the identification of key KS drivers. The method used here involved the **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, **P**olitical (STEEP)<sup>33</sup> framework, which provides a convenient way of orienting attention across the range of possible factors. Each of 5 groups focused on one of these headings, defined as follows:

- social: circumstances and (especially) trends concerning people and their everyday social relationships: demographics, lifestyles, families, health, crime, and education;
- technological: circumstances and (especially) trends concerning the development and application of new knowledge about the world: scientific and technological developments;
- economic: circumstances and (especially) trends concerning market relations: conditions in international, national, regional, and local economies, including developments in the labour force, income, and the infrastructure;
- environmental: circumstances and (especially) trends concerning natural and physical environments and human impacts on these: related to energy, resources, pollution, reuse and recycling, biodiversity, protecting ecological bases, food protection, air and water quality;
- political: circumstances and (especially) trends concerning political relations between social groups, states and governments at all levels: political conflict and modes of governance, political participation, government policies, legislation, regulation, litigation, and court decisions.

Briefly, the groups were requested to brainstorm a series of critical trends shaping a KS that fell under the STEEP category of their group. A list of possible drivers had been prepared in advance and was presented to the groups in order to:

- stimulate the break-out groups;
- indicate that we hoped the groups would consider a wide range of topics;
- clarify how the drivers were to be formulated as trend statements.

It was stressed that this was neither a specification of topics that they should consider, nor a statement of plausible forecasts. It was simply intended to provoke the participants to think widely, and in terms of the framework of the exercise.

The groups were then asked to consider their topics and to cluster these into sets and subsequently, to select a smaller set of critical trends. Finally, the groups were asked to indicate the importance of each trend for a KS and the uncertainty as to whether this trend would or would not develop in the EU over the next fifteen years. Information was fed back to the groups in a plenary session, with discussion of what the 15 key drivers were and how they should be defined.

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<sup>33</sup> Sometimes a 'values' category is added and the approach named STEEPV - but for logistic reasons in this workshop, it was more appropriate to break into 5 groups than 6.

### **Break-out 2**

The next step was to examine major implications of the drivers for the three areas of living conditions, working conditions and industrial relations, which were scoped for the groups as follows:

- living conditions: work in the home, domestic division of labour; living standards; time use; work-life balance; social and political participation; and access to public services;
- working conditions: levels and quality of employment; skills and training required at work; quality of working environment (including health and safety, stress and degree of autonomy); part-time and 'new' forms of work (telework, mobile work, flexitime);
- industrial relations: strength and strategies of trade unions; professional associations and other means of employee organisation; participation in decisions concerning organisational and technological change.<sup>34</sup>

Again, five groups were formed. Each was requested to consider the implications of three of the top 15 drivers for LC, WC and IR. To stimulate the groups, a list of possible implications was presented together with the range of topics that might be considered and the way in which these should be formulated.

There was some feedback to the effect that the time for discussion was too curtailed; the groups would have preferred more time to review the topics they had selected. Some participants commented that many of the topics reflected a somewhat short-term focus, not fully taking into account the more important and qualitative changes that might eventuate over the coming years. Long lists of possible impacts were generated. Groups were requested to specify the most important of these.

The project team made a selection of ten impact topics, reflecting the three areas of LC, WC and IR, on the basis of the inputs from the five groups, and these were fed into a further set of break-out groups.

### **Break-out 3**

In the previous sessions, break-out groups were organised around STEEP categories and the topics stemming from them. In this session, however, five groups were asked to focus on certain of the three areas of concern to the Foundation. Each group was asked to consider the implications of the entire set of 15 selected STEEP trends for its set of impacts: to assess the influences of the 15 KS drivers on two given impact trends on LC (2 groups), WC (2 groups) and IR (1 group). The appropriate parts of a Cross-Influence Analysis (CIA) matrix<sup>35</sup> in which the 'drivers' (vertical axis) were set alongside the LC, WC, and/or IR developments. Participants were asked to assess how these drivers influenced (reinforcing or acting against) each of these. They first made individual judgements on specially-prepared sheets of paper, using a rating scale; then the individual judgements were put onto wall posters and areas of consensus and dissensus discussed, so the group position on each cell of their part of the matrix could be reached.

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<sup>34</sup> The point has subsequently been made that these topics, intended for purposes of stimulus, omit any with a focus on employers and their roles. This may have influenced the formulation of specific topics by the group. The workshop did devote some time to issues of union adaptability, but it also considered issues relating more to employer initiatives (e.g. network organisations), so it is unclear how much of a problem this was. However, the criticism should influence the design of future exercises.

<sup>35</sup> This is not identical to the more familiar cross-impact analysis methodology. The method was developed because it could be applied in a less onerous way for participants. Cross-impact techniques are very demanding since they require numerous repetitive judgements to be made about the probabilities of events co-occurring.

### CIA analysis

The CIA analysis allowed investigation of how far the various driving and shaping factors were seen as being likely to influence living and working conditions and industrial relations. It is possible to examine which of the drivers are most influential, which of the influenced features are most heavily influenced by the list of drivers, what the pattern of influences is, to identify sets of drivers that have similar influences and sets of implications that tend to draw on the same drivers. It is probably not appropriate to go into too much detail about these results here, but one outstanding aspect of these results was that practically all of the influenced features were seen as being reinforced by far more of the drivers than diminished them. In other words, the topics chosen in areas of interest to Foundation were particularly important social implications for a KS and were seen as likely to be brought into being by the factors identified as likely to characterise Europe's KS.

The most extreme instance of this makes for a very interesting argument. The topic formulated as 'Trade unions become more innovative in recruiting and retaining various segments of the workforce (e.g. temporary/contract workers)' - was considered to be reinforced by no less than 13 of the 15 KS drivers. However, when the results were examined more closely it became clearer that the influence was moderately or weakly positive rather than strongly positive. When fed back to the workshop, one participant in particular argued, as she had in earlier sessions, that the trend for trade unions to become more innovative was extremely unlikely, reflecting her own experience as a teleworker in dealing with union bureaucracies.<sup>36</sup> It seemed to be counterintuitive that this trend was being reinforced by many KS developments, all of which were considered to be plausible by the workshop members. However, the members of the subgroup dealing with industrial relations considered that these impacts were likely. The topic is clearly controversial and required more time than was available to resolve, assuming this to be possible. At least the method brought the topic and the dispute to the fore.

### Cross-national workshops and foresight

It may be recalled that this workshop was intended to be three things: a sounding board about issues; a demonstrator of KS foresight methods and thinking; and a prototype for the use of expert opinion about a KS. One lesson derived from the workshop is that it is hard to combine multiple objectives. This was rendered even more so, because the workshop sat alongside the presentations and discussions of the wider conference. The result was that the precise purposes of the activities became confused on a number of occasions, a point made by participants. The nature of these goals needed to be carefully explained on these occasions and a number of misunderstandings had to be confronted, and resolved. One recommendation for future work applies, then, to situations where it proves necessary for logistic or other reasons to combine activities in this sort of way. In such cases, it is necessary to clearly demarcate the distinct elements in the programme and at the event itself, and to provide clearly visible reminders of which type of activity and what goals are being undertaken at any point in the process. Sufficient time needs to be allocated to workshop activities, whose demands are not always easy to predict in advance - but where, especially when the topic proves engaging, it appears that there is never enough time to discuss matters thoroughly enough.

A number of problems were encountered in practice with the CIA method. For example, groups considering the formulation of topics tended to be imprecise, or being unsure whether they were talking about absolute or relative changes (e.g. in the situation of poor people). Again the time available was felt to be too short, and the groups found it hard to think ahead 15 years or so - longer immersion in the process, with more futuristic background material, might

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<sup>36</sup> This suggests that in a CIA analysis it might be helpful to have participants rate the likelihood of each of the impact trends developing, in much the same way as they did for the drivers.



have been helpful. Some additional issues (e.g. environmental problems, genomics self-diagnosis) could not be fed back into the main CIA. Such points raise useful lessons for the design of CIA or other judgmental discussion activities in future workshops. They demonstrated a high level of sophistication on the part of the participants, and identified substantive issues that are also of great interest for the later work of Euforia.

One positive experience was the approach developed to implement the CIA in a large group setting. By forming a number of break-out groups, each of whom had the task of filling out part of the matrix, two things were accomplished. First, the groups were able to focus on a number of discrete topics, and be provided with a task that challenged them to elucidate their views and confront their opinions with other people's experience. Second, matrices such as that used here are known to be very laborious to complete, and in their normal implementation, where one person has to fill out the whole matrix, they are liable to try the respondent's patience to some extent. Transforming the task into a group activity reduces the volume of repetitive work. The resulting judgments are aggregated from a number of sub-groups and do not represent a single coherent viewpoint. But if the sub-groups have been able to talk through the issues to a reasonable degree and are not made up of radically different social groups, then it seems reasonable to treat the combined data as a matrix of the group's opinions. A recommendation for future work is that such methodological approaches are further experimented with and developed, and that time be allocated for the whole group to reflect on the results of combining subgroup judgments.

A number of more specific points emerged from the exercise are important to bear in mind in designing future activities of this sort:

- The formulation of drivers and their influence in break-out groups is bound to be problematic. Small groups of people with technical experience of using such methods should be established, and given sufficient time to make the statements clear and concise.
- When using a process like CIA, care needs to be taken both in implementation and interpretation. On the first point, participants may find it difficult to work through positive influences on topics that they evaluate negatively. (That is, they wanted to say that the driver had a negative influence, because it was reinforcing a negatively regarded feature). This requires very careful design of statements and instructions. There was found to be some lack of clarity about whether absolute or relative values are being discussed. For example, are we talking about more poor people, the poor people becoming absolutely poorer, or the poor becoming relatively less well off? Again this needs to be identified and clarified. On the second point, the interpretation of 'neutral influences' requires caution; they may represent a real lack of connection between the trends, or conceal the fact that diverse results, across regions, over time, between different aspects of one or other complex variables, are being averaged out.
- New drivers (e.g. nationalism) and 'impacts' (e.g. environmental pollution) are liable to be identified in later break-out groups. Ways to capture these issues and, ideally, build them into the process, should be examined.
- The logistics required for workshops and conferences are different, and any future attempts to encompass both on a single occasion need to bear this in mind and make facilities available for both types of event.

### **The national workshops**

Two workshops were held in each of the three countries participating in Euforia. The second workshop devoted a large part of its time to scenario analysis, which is the subject of a separate section below. Here, the focus is on the other activities undertaken in the two workshops.

Each national team drew up a list of experts to invite to the workshops, based on the inputs from the members of the national Euforia team. The aim was to have a balance between foresight researchers, academics, policy-makers and representatives of employees and employers' organizations. The target was to gather about 15-20 experts covering all

the fields of interest (industrial relations, working and living conditions). While each country was able to enlist what appeared to be a suitable mix of people, practical problems were encountered - for instance in Greece representatives of the employers and employees organisations failed to make the first workshop, without prior notification, so that they could not be replaced. (Those taking part in the workshops are described in the appendices dealing with the country reports.).

The first workshop was intended to:

- provide national perspectives on drivers of knowledge society on living conditions, working conditions and industrial relations;
- formulate a list of recommended topics for inclusion in the Delphi survey.

The precise methods employed were left to the national teams to define, according to local circumstances and logistic issues, but it was suggested that methods such as STEEPV analysis (see the CIA report) were employed to assess drivers and that teams draw on the results of the CIA study and early indicators reports. In general, the discussions involved brainstorming, writing ideas onto flipcharts, grouping them, using post-it stickers to indicate importance, etc.

A summary of the Greek workshop is used as an example of the methodology adopted in these workshops.

A set of Greek language documents was distributed to the participants two days before the workshop:

- a text was prepared about the theoretical background (what is the knowledge society and the aims of the Euforia project) that the participants should have in mind when thinking about the trends and the Delphi statements;
- a list of 30 trends was prepared based on the list provided by PREST (this incorporates the CIA analysis) and on the scenarios that were developed under the Greek National foresight programme. The thinking behind the preparation of the trends was 'how does this topic relate to living and working conditions and industrial relations in a KS?' 11 trends were country-specific and the rest 12 were applicable at European level;
- some Delphi statements were also distributed to the participants from a list provided by PREST (drawn from the UK, 1994-5 foresight Programme), having been translated into Greek.

The workshop itself:

- started with a brief presentation of the theoretical background that should be agreed among the participants before the start of the real discussion;
- followed by a discussion to verify / change / adjust / each one of the trends and add any new ones. First the 'European' trends were discussed and then the 'Greek' ones. The result was a list of trends and impacts (18 for Greece and 22 for Europe in general);
- then the participants were presented with the Delphi examples (from PREST list) and the rules to make Delphi statements (provided by PREST). Clarifications were given as to what differentiates the trends and impacts from Delphi statements. In particular it was emphasized that in drawing up Delphi statements our thinking should go further beyond the identified trends and impacts and we should find specific 'results' from these trends and impacts. When the trend is for example that the public education system in Greece is not oriented towards covering the market needs, one Delphi statement can be that 'private non-profit education bodies are created having as a basic aim to provide the skills needed by the market';

- the participants were asked to draw up 3-5 Delphi statements focusing on Greece. These Delphi statements were gathered and then modified further by ATLANTIS team according to the rules provided by PREST. Time did not allow for the drawing up of Delphi statements for Europe in general, but the ATLANTIS team enriched the Delphi list with other statements after the workshop. The result was a list of Delphi statements (9 for Greece and 19 for Europe - including Greece). Time did not permit for the rating of the Delphi statements regarding desirability, likelihood, or importance.

Following the workshop, the revised theoretical framework, the new trends (Greek and European ones) and Delphi statements (Greek and European ones) were sent for comments to the participants as well as those who did not come (although they had confirmed participation before the workshop) three days after the workshop. The experts on industrial relations that were missing from the workshop were particularly pressed to provide their input by e-mail. Together with the workshop results, the participants were also sent an evaluation form about the workshop

It will be apparent that a great deal was accomplished, but that the compressed timetable made it difficult to follow all of the procedures that had been suggested in detail. Similar time pressures were experienced in the other countries. In Finland desirability and likelihood ratings were made on all topics, for instance, but in Germany there was a more basic assessment of importance.

### **Implementing workshops in knowledge society foresight**

While concluding that workshop discussions are very important in activities of this sort, a number of practical points were also noted:

- there is considerable scope for using decision-support tools in such workshops. The German workshops used a simple paper-based 'metaplan' technique, which enhanced their output. Computer-based systems now allow for capture of content and can enhance face-to-face meetings (as long as used sensitively, rather than overwhelmingly);
- the Greek workshop demonstrated that there is liable to be a need to put effort into agreeing on the terms of reference for a concept like KS, before constructive discussion can take place;
- it is important to attempt to retain stakeholders and experts on specific fields, and perhaps to have back-up participants in the case of drop-outs. Follow-up communications after meetings may be used to obtain some (less rich) input from missing participants.

In discussing trends and developing Delphi statements, many of the participants seemed to be somewhat 'stuck' in today's situation and how it needs to be improved. Methods for stimulating more creative thinking - such as providing them with scenarios, timelines, and roadmaps - may need to be explored. Possibly, some younger researchers may be involved in developing Delphi statements based on expert discussions of trends, impacts, obstacles, etc - at least this was a suggestion from the Greek team.

### **The Delphi study**

All foresight projects depend heavily on the elicitation of subjective opinion: the Euforia project was no exception. How this was done in national centre workshops has already been described. Recall that it was indicated that one output from their first set of workshops was information from which the Delphi survey of opinion - in principle expert opinion - would be constructed.

While a Delphi is an opinion survey, it is not a conventional opinion poll. It is designed to feed information back to its respondents, by circulating the outcome of the responses to the first round (and possibly successive rounds) of the survey,

before asking people to revise their replies (if they wish). Respondents are thus encouraged to take account of the views of others. However, the time-honoured belief that a Delphi is designed to create a consensus is misplaced, as a wider basis for interpretation is beneficial. The survey is circulated, to the same set of respondents, at least twice. The purpose of providing this feedback, and offering the chance for respondents to modify their judgements, is to promote exchange of views and information about the future. The anonymity of the survey should enable the influences of those people who are more knowledgeable, not simply loudest or most senior.

The Delphi statements used in Euforia were constructed as follows:

- the topic lists that emerged from the first national workshops were consolidated into a single database (with 172 entries);
- the database was searched, using key word stems, to identify groups of topics with similar characteristics - 30 groups were identified;
- the individual topics in these 30 groups were then manually annotated with the country of origin and other information (whether or not it was among the recommended set from its country of origin); this reduced the total 136 topics;
- the groups were then sorted manually into smaller sets of topics, amalgamating those that were repetitions or were immediately seen to be sufficiently similar to be written as one topic at a later stage: this further reduced the number of topics to 77;
- the topics were then edited using conventional rules for writing Delphi topic statements; during this process more topics were eliminated as further overlapping or repetition became clear;
- the remaining topics were examined for their relevance, reasonableness and robustness where a number were eliminated because the topic was considered to be well advanced already or lacked clarity regarding its content despite editing. After this some 25 topics remained; the PREST team added five to make the set up to the target of 30 topics;
- subsequently, each national centre has been asked to name five (5) topics from its original list, that do not appear in the 30 listed here, which they consider vital to their national location. With these included, 35 topics were to appear in the web-based 'questionnaire';
- early on, the project team thought that the survey should have a maximum of 20-25 statements. However after analysing, synthesizing and clustering the outcomes of all information available the number cross-national statements increased to 30. It was also agreed to include two more statements proposed by the project sponsor. So, after each country provided their five statements related to national specificities the final number of statements augmented to 37;
- the next step was clustering the statements into six categories. Each statement was composed of 25 to 30 words, which multiplied by 32 represented quite a challenging amount of information to be remembered in an unstructured format. Therefore, a simple framework was required in order to help prospective participants to recall issues of interest. Also, by providing six categories participants could access, if they wish, only the questions related to one specific category and send their partial questionnaire, thus making completion of the Delphi much faster and easier.

The 32 cross-national statements were clustered into the following six broad categories:

- *governance and mobility*: issues such as the way EU governments interact with citizens and labour organizations; working force immigration and emigration; the use of technology and ICT by governments; etc;
- *health and privacy*: issues such as the way EU policies deal with genetic engineering; civil liberties, health monitoring; DNA screening; creation of genetic databanks; etc.;

- *industrial relations*: issues such as the way EU industries manage their networks; monitoring and supervision through electronic means; employment contracts; role of trade unions; decision-making practices; etc.;
- *living conditions*: issues such as the way EU citizens behave and live; ethics; justice; education; social isolation and loneliness; lifelong learning; work-life balance and family relations; role of ICT in everyday life; etc.;
- *sustainability and development*: issues such as the way European countries deal with sustainable development; regional employment; business management practices; environmental technologies; wealth creation and quality of life; effects of EU enlargement; etc.;
- *working conditions*: issues such as the way European countries deal with gender-related work inequalities; working time; forms of employment; organizational learning; violence and harassment at work; etc.

It was then necessary to determine whether the Delphi statements should be exploratory (asking when something will happen, or how far a development has progressed by a certain year in question) or normative (asking what desirable things could happen and what would be required for them to do so). The exploratory option was chosen, asking how far a development will have progressed by the time horizon of 2015, a rough approximation to the time horizon of 2010 set in the recommendations of the Lisbon Council, rather than the more common form of by when a development will transpire. This would allow comparison between countries at different stages of development to be made more readily.

When responding to the Delphi statements, the respondents were offered a choice from the following five options:

- (1) the statement underestimates the situation by 2015;
- (2) the statement is about right by 2015;
- (3) the statement overestimates the situation by 2015;
- (4) the statement will not follow this path; and,
- (5) the statement is too uncertain (participant does not know or cannot provide any judgement on the development of the statement).

After this, respondents were asked to indicate the influence of each statement on each of nine factors related to the conclusions of the Lisbon Council and the Foundation's mission. The specified factors were:

1. **social cohesion** - those features of society that relate to social integration and the reduction of conflict between or within social groupings;
2. **social exclusion or divides** - any matters that create or exacerbate inequality and inequity between or within social groupings including the 'digital divide,' access to education, gender and other equality related issues;
3. **sustainability/environmental quality** - those matters that influence the development of the natural and built environments in which future generations will live;
4. **employer-employee relations** - includes the role of trade unions, management, and employees including employment standards as set by regulations and directives;
5. **economic growth/wealth creation** - those matters that increase national income and strengthen the industrial base;
6. **entrepreneurship and innovativeness** - those matters that enable and promote new products, processes and services in existing businesses and the formation of new businesses in novel fields;

7. **employee exercise of autonomy and responsibility at work** - including the advancement of the quality of working life through freedom to make decisions, to exercise management of time and to embark on retraining;
8. **work-life balance** - those matters that enable people to manage the stresses caused by for example the pressures arising from longer and unsocial working conditions;
9. **job creation** - refers to the expansion of employment opportunities at all skill levels irrespective of gender.

For each factor, the influence of the statements were rated by selecting one of the following criteria:

- the statement would strongly increase/improve the factor;
- the statement would increase/improve the factor;
- the statement would have no effect on the factor;
- the statement would decrease/deteriorate the factor;
- the statement would strongly decrease/deteriorate the factor.

The Delphi was run online and was presented in each of the national languages as well as in English. Many difficulties were encountered in achieving a workable online Delphi: these were often associated with the multilingual nature of the survey. Greek characters caused problems with the software and the initial translation of many of the topics, especially into German, was found to be suspect, requiring rapid efforts to correct this. A reasonable level of involvement in the survey was obtained from Greece and Finland, with about 50 participants in each case (the number is rough, because some people only entered part of the survey); Germany had a disappointing level of about 20 participants, but there were many people taking part from other countries (mainly the UK and the Netherlands) bringing the total response rate to over 180. This is still lower than desirable. The main issue with a Delphi is not to get a large enough sample to be representative of a population, but rather that it taps into expert knowledge. However, the range of topics considered is such that a lot of people may be required to ensure that this condition is achieved.

### **Delphi studies and knowledge society foresight**

The national centre reports fulfilled their purpose by providing input material for formulating the Delphi topics. From these the managing contractor created a set of 32 topics through a reduction process already described, that was at times unavoidably arbitrary. As far as possible the spirit of the original list of topics that emerged from the first national workshops was kept. The main concern with the Delphi (apart from those of translation already referred to) was the lack of a committed body of respondents in each pilot country. It was a mistake to assume that a sufficient number of respondents would emerge from relatively light marketing of an open website. A similar comment can be made about the response from international participants. In any larger study it will be necessary to ensure that in each country there is an existing body of interested and willing respondents to ensure a reasonable response rate in the region of 10% of the likely population or much higher of a committed one.

Experience with the online Delphi confirmed some hopes (simplification of data entry which is self-verifying, cost reduction from the elimination of printing and postage, compression of the time needed to complete the survey, ease of presentation of the outcome). Others were not realised (the out-of-sight-out-of-mind phenomenon with the online version which is not so obvious with paper based versions, difficulties in working with multiple screens for those not familiar with IT). Greater attention will need to be paid to the respondents' level of skill with online working; it cannot be taken for granted. A further problem is the ever present lack of appreciation of the viability of survey with a low percentage response rate, particularly by people from a scientific background who expect statistically high response rates

(e.g. in the region of 90%) for the outcome to be of any value. This is one matter that needs to be dealt with in any introductory training session for all those concerned with executing a study

Despite the low response rate the project demonstrated the feasibility of using a Delphi of the appropriate format in probing (or sampling the territory of) the many dimensions of an emerging KS. To have done more than this would have required a much larger set of topics which is not the object of a feasibility study.

Analysing the Delphi output was not a problem given the tools available. Importantly, the costly and time-consuming stage of data entry, with all its attendant risks, from a paper-based survey was removed. The results themselves are fairly typical and when presented and interpreted from histograms tell an interesting story, which, under more favourable circumstances would have been, capable of extensive study. The need to delay the closing of the Delphi, to try to get a better response rate, meant that the survey outcome was available to our partners for only a limited time before they had to complete their country reports. However, this was an organisational matter and nothing to do with the capability of the Delphi process.

Despite all this, Delphi remains among the most useful tools even if some people think it is a disreputable one. It makes discussion groups focus on the questions they would like to ask and get opinions about, and makes respondents think about the questions they face; it is one reason why the process is not popular as it is harder than hand-waving in discussion groups. There's also a good deal of persistent misunderstanding about the interpretation of the output. For example, panels frequently complain that they do not get unusual ideas and new information from the survey. However, panels that do not ask unusual questions can hardly expect novel responses. Fortunately, that was not the case in the Euforia survey, where the workshops did not pose questions to seek confirmation of their established ideas and opinions.

A cross-national, multilingual online Delphi is more difficult to manage because the combination of the process and the use of online tools posed an unfamiliar package for respondents to cope with. Later there are some recommendations about management and staffing, but none of the problems encountered were completely unexpected. The most tiresome problem was translation of the questionnaire into Finnish, German and Greek. The effort and cost involved should not be underestimated. Equally important is the effect translation can have on the quality and credibility of the Delphi process, since the original English nuances can easily be lost with uncertain influences on the way the respondents interpret and respond to the questions. However, in the context of the study the Delphi process showed much promise with the attractions of online working being obvious and worthy of further development. In this study, the Delphi results remain the only source of quantified opinion concerning topics that are believed to relate to a European KS. Education and training in the nature of the Delphi process would have been of value in the early stages of the project.

Traditionally Delphi surveys have been conducted through postal surveys. The Euforia project's use of online methods had advantages and disadvantages. The technique saved costs on post, graphic design and printing. Data was input directly by the respondents and subsequent processing was rapid. However, there were some problems of access, especially for people with older computers or poor connections. Translation proved a problem, and the particular Delphi format employed, though based on surveys pioneered successfully in Latin America, was a source of aggravation for some respondents. The overall response rate was much lower than hoped, possibly because at the same time users were experiencing an upsurge of spam and viruses. Another factor may have been that the need to log in to a website to fill in a survey was just too much of a break from normal routines while respondents were online.

It would be ironic if in a KS an online method of eliciting knowledge and opinions proved inferior to pencil and paper techniques. The obvious conclusion is that more effort needs to be put into the preparations for an online Delphi, not just on the technical side, but in the management of the survey.

## Scenario writing and analysis

Scenario writing was introduced into the Euforia project as a way of:

- integrating together ideas about the emergence of a KS in each of the three pilot countries; and
- creating disciplined visions of the future with the intention of drawing attention to ideas that are not ‘in good currency’.

### Introduction to scenarios

All scenarios need to be treated with care. Theoretically, all scenarios have an equal, but vanishingly small likelihood of occurrence, since there is an infinite number of ways the future can develop. Any scenario is then a collection of ideas for how a future might unfold. Each scenario will be idiosyncratic to the person or people who develop it. However, in each case the purpose is the same, to present ways of looking at the future that will help to expand the range of thought involved in exploring the evolution of a KS in Europe through the sample of three member states.

In the present instance three levels of scenarios were suggested to the national centres namely global, EU 15 and EU KS, leading to specific pilot country scenarios. The use of these three levels enables the specific pilot country scenarios to be placed in the context of wider events that will impact upon them. This is the principle of nested scenarios. The national centres in the pilot countries were not expected to construct a complete set of nested scenarios and in any event broad outlines for the ‘higher level’ scenarios were sufficient for present purposes. It was recommended that the ‘surprise free’ or ‘reference’ scenario be regarded as simply a reference point; its content should fall in the ‘range of indifference’ where the reader does not perceive it to contain any surprises. Each of the other two scenarios should have a short title intended to convey its essence. The national centres in the pilot countries were, however, left free to make as much or as little use of the recommendations as it was important to observe how local cultures influenced the development of their individual scenarios.

### Some qualifications

Some brief qualifications are always necessary to place scenarios in perspective. In the present instance these were:

The time horizon is taken as 12 years and ends at 2015. In that period it is assumed that:

- there is no global war, nor war on the European continent north of latitude 36 degrees N and west of longitude 60 degrees E;
- terrorism continues sporadically throughout Europe; it does not affect economic development as a whole, but does cause temporary difficulties in specific locations from time to time;
- violent disputes between ethnic groups and competing belief systems that are not formally called ‘wars’ also erupt from time to time throughout the period;
- the EU is enlarged to 25 countries;
- the European Commission remains intact and largely unreformed despite the current proposal of a constitution for the enlarged EU;
- the ECB survives as an independent body and applies policies to try to ensure that the euro develops into a hard currency irrespective of the social and political implications;



- some major epidemics of infectious diseases occur in addition to AIDS. Some ‘old’ diseases, e.g. tuberculosis, return as a drug resistant variants and, due to the lack of attention to public health, become endemic within the time horizon. But there is not a major pandemic such as those affecting Europe in the Middle Ages (though some epidemiologists are speculating about the likelihood of such an eventuality);
- no significant shifts in the European climate or weather patterns occur other than short term variations that arise from relatively familiar events including volcanism and the recurrences of El Nino round about 2004 and 2011; these will have indeterminate effects that may include severe and unusual local weather patterns (similar to those that have occurred during several recent El Ninos and after the major eruptions of Mount St. Helens and Pinutabo). We recognise that a body of opinion anticipates that climate change (anthropogenic or otherwise) could have substantial impacts over the next decade or two, and note also the upswell of catastrophist speculation about major natural disasters (supervolcanos, asteroids, giant waves, etc.);
- it should be remembered that scenarios are ‘pictures of the future’ and are neither forecasts nor predictions of what will happen in the time horizon. The scenarios for the way a KS may develop in each partner country, ought to connect with, but lie beyond, common modes of thought in country X. The scenarios ought to stimulate debate about alternative policies and strategies for country X and the role of a KS within those development policies, drawing out the Foundation’s special interests;
- as scenario writing is an integrative step, much of the information gathered earlier in the project should have assisted the development of the national scenarios describing possible alternative ways in which a KS might evolve in each partner country.

Exploring the territory of the future demands the admission of huge uncertainties. Doing so for the emergence of a KS is no different. The use of scenarios became popular because they are seen as perhaps the only way in which the range of uncertainties can be glued together in an understandable way. Scenario construction is a resource intensive process and any study that involves the use of scenarios has to acknowledge that fact. Often the success or otherwise of using scenarios is limited by the resources available. Similarly, the capability of the team involved in scenario building to grasp the often huge range of topics that are involved cannot be ignored. Again, scenario development in the Euforia project is no different to any other study. As it turned out, scenario construction was a learning process in itself and, whilst it was completed successfully, the scope of the scenarios themselves, and by reflection the project itself, must be considered to be very limited.

#### *General plan recommended for ‘nested’ scenarios*

The general plan of the suggested set of nested scenarios is illustrated in Table 14.1. As can be seen, the three scenarios paint very different pictures. The surprise-free scenario should be just that; it should not hold any surprises in terms of country X’s development toward a KS.

Table 14.1: Outline plan for nested scenarios

Scenario content		Scenario title		
- Global		'Rakes progress'		Beginnings of sustainability
- EU of 25 countries		'Hard times'		European renaissance
- Lisbon Council Declarations		' Knowledge society by decree' Lisbon via EC directives, Council of Ministers' 'diktat'	'The normal state of affairs' KS by a mix of EC directives and evolutionary events	' Knowledge society through self-organisation' KS arises through 'uncontrolled' steps by individuals and organisations
- National scenarios				
Foundation's specific interests	living conditions			
	working conditions			
	industrial relations			

Globally, 'rakes progress' is a world where warnings about most incipient and actual natural difficulties surrounding resource availability and demographic patterns are largely ignored making the world a divided and dangerous place. By comparison, the 'beginnings of sustainability' is a very different world in which global matters are treated differently and co-operatively. For the EU 15, 'hard times' paints a picture of a world in which Europe largely fails to retain its place in the world. One might almost infer that the EU remains in the world's councils by default rather than by right. 'Hard times' is a scenario in which Europe and the enlarged EU are not happy places. By contrast, 'European renaissance' tries to portray a Europe and EU in which failures have been recognized and are beginning to be replaced by a new spirit.

The outcome of the scenario development revealed some very different thought processes that may have been influenced by circumstances beyond the control of any of the national centres, especially Finland. Differing appreciation of the art of scenario building emerged first from the perception of the need or otherwise to use the notion of nested scenarios. Nesting implies placing the local scenario in the context of EU and global events, all of which can reach down to individuals, their ways of living and working and the regulatory environment in which those activities take place. For example, the value pair of *freedom versus control* may myopically be regarded at a personal level. However, for the individual this pair is now being influenced by global terrorism, mobile telephony, paedophilia and child abuse within the family (to suggest a limited subset) with losses of personal freedom being as considerable as the gains from social control. If the appreciative setting<sup>37</sup> of the scenario builders is forced to consider local events only then the characteristics of the scenarios themselves are not likely to be sustainable. To this extent scenarios are 'straw men' whose demolition promote the kind of discussion that is intended to hasten further ideas relating to a national KS but in a wider setting.

As with all imagining of the future there is an underlying adherence to the dictum '... vision without discipline is daydream' in the scenarios. As they are used in formulating alternative ways in which a KS develops in country X three questions need to be constantly in mind, namely:

- What is possible?
- What is achievable?
- What is desirable?

<sup>37</sup> Vicker, Sir Geoffrey, Appreciative behaviour, Acta Psychologica, 21, 274-293, 1963.

While these questions apply more obviously in some spheres than others the important corollary to them questions is the *How? Why? When? and Where?* set.

### **National centres' scenario development**

As with other elements of the study, a dilemma was confronted concerning how far the three national groups should use identical approaches, thus maximising cross-national comparability, or dissimilar ones that would allow for some assessment of the relative strengths and merits of different approaches. Given the lack of familiarity of some partners with scenario development, PREST suggested the structure outlined above, which involved the use of nested scenarios.

In practice, the different national workshops developed different approaches, demonstrating (part of the) the very wide range of different styles of scenario workshop that can be implemented. Germany followed a more or less 'normative' approach. After the project team had generated the three framework scenarios, the workshop chose to focus on what they believed to be the most desirable future, examining how this might be achieved within a single global context. Finland developed three scenarios, but with little assessment of the global context. Greece developed three scenarios that considered alternative paths of world development; the recent Greek foresight programme facilitated these.

The initial framework provided to the national teams suggested that all teams begin by proposing three skeletal scenarios to their workshops; an account of the three is as follows:

- **'best guess'** extrapolation is a vision of the future that assumes a generally positive trend persist; it is the 'official future' aimed at by the political mainstream achieved without substantial structural change;
- **'hard times'** scenario; where the problems and contradictions of the above model come to the fore, where business as usual results in a declining competitiveness and/or cohesion;
- **'structurally different'** scenario which, in the present study, could be seen as encompassing a vision of a KS marking a paradigm change and thus is accompanied by substantial restructuring of socioeconomic relations; this is likely to be more an aspirational future.

These are archetypes the national teams fleshed out in different ways before their workshop, drawing on existing scenarios or debates for their country. Each workshop was presented with the scenarios and discussed them: later, the workshop moved on to the detailed work of preparing the scenarios.

The original proposal was that all workshops should split into three groups, each of which would elaborate one of the three scenarios. Each group would discuss its scenario, in particular the following questions:

- signposts that would indicate movement toward this particular scenario, for example, expressed as headlines in the media or what trends and events would make the scenario most likely to happen. (A useful mini-exercise is to generate a name or headline for the scenario itself);
- assuming this scenario would occur, how do the signposts, event and trends fit into the various features listed in the framework set out below;
- what would the likely reactions and strategies of major stakeholders be? What policies and social innovations might help people cope with or avert negative aspects of the scenarios and maximise positive aspects (if any)?

The workshop then moved on to develop an analysis of the scenarios within a common tabular framework supplied by PREST. As noted, the German workshop adopted a normative approach and elaborated only the most desirable scenario - a common practice in some types of foresight study, and one with a great deal of legitimacy. Although this was an

anticipated option it was suggested that if an aspirational approach was required, the workshop would need to split into subgroups working on specific elements of the aspirational scenario - e.g. its living conditions, working conditions and industrial relations.

Comparison of the way scenario development proceeded is set out in the tables 14.2 - 6 below to enable similarities and differences to be readily identified and appreciated. Subsequently, the table records and comments on the way in which the national centre reports developed, including the contribution from scenario development.

Table 14.2: *Scenario approaches and preparatory work for scenario development*

Finland	Germany	Greece
<p>The emerging Finnish KS is based on a highly skilled population, equal division of prosperity, high investments in infrastructure and R&amp;D, and functioning social and healthcare sectors to create conditions for competitiveness through innovativeness, enabling extensive public services in every region. Favourable conditions of working life are offset by high unemployment, aggravated by low entrepreneurship, with skill shortages likely in the future.</p> <p>The three scenarios were problems scenario: King of misery – stagnation; business as usual: realistic model; good case: Utopia – dolce vita for everybody. The outcome of the ‘scenario analysis’ is indicated with emphasis on flexibility in all fields, with influences on the standard of living, work-life balance and social polarisation. Threats to a KS growing are discussed referring to the need to attend to social developments to see that the development of a KS is widely discussed and appreciated.</p>	<p>Germany is assessed as being on its way to a KS. Various indicators are seen as reflecting this emergent KS. In contrast, there are some harsh criticisms of German education and the sluggishness of the economy. A dependency culture is said to be one aspect of the national KS as it now exists.</p> <p>Three scenarios are presented. An aspirational scenario (‘Change: from average to excellence’) was chosen as the preferred way forward. The policy implications given by the experts are clear – there is reference to Agenda 2010 – requiring a redefinition of the role, function and self-conception of key players to enable redesign of society and the establishment of a common vision.</p>	<p>In the light of the Lisbon objectives and the concepts of a KS, Greece is diagnosed as a laggard in KS development.</p> <p>Three scenarios (two are presented) were developed to portray ‘awakening’ and ‘nightmare’ visions for Greece. Of the two, the ‘awakening’ leads to a model of a KS that requires re-orientation of policies, careful design and effectiveness of measures and also radical social changes allied to strong political will. Although it was considered the least realistic, it was believed to be the one that would bring sustainability in Greece’s development and would lead to the development of a KS.</p>

Table 14.3: *General shape of national centre report*

Finland	Germany	Greece
<p>Nine-page description goes into Finland’s current situation in some detail. This makes use of statistics from Eurostat, OECD, Finnish ministries and the projects indicators report – this is well used</p>	<p>15 pages used to describe Germany as it is now with respect to a KS (this concept is not defined in the report, but the workshop was informed by material produced in the course of Euforia on this topic). The report draws much on quantitative data (including much that does not derive from Empirica’s own work.) A SWOT analysis is developed</p>	<p>16 pages used to describe the current situation in Greece including a SWOT analysis. The approach is very creative and wide-ranging. Use is made of many different data sources (including the Indicators report).</p> <p>Notably the Greek national report was the only report to use hyperlinks to facilitate navigation of the document. This is intriguing in light of the general portrait of Greece as a laggard in KS development.</p>

Table 14.4: Use of trends, drivers and SWOT analyses

Finland	Germany	Greece
SWOT presented as a table without commentary. Trends and drivers presented as a series of short 'Delphi like' statements using the STEEPV acronym as the structure	The SWOT analysis is included in the section on 'Germany as now' and draws strongly on the indicators report in a discussion that precedes the presentation of the outcome as a table. The discussion of drivers is in a different section. 15 are listed and described in short vignettes that are rather more than extended 'Delphi style' statements	Report a series of STEEPV-grouped trends (7 S, 1 T, 5 Econ, 0 Ecol., 2 Pol., 0 V) accompanied by 7 counterpoint boxes. SWOT is set out in 5 counterpoint boxes (S & W) and 4 counterpoint boxes (O & T). Discussion of the desirability and likelihood of trends under the headings of LC (4); IR (3); WC (2); Gov. & Mobility (3) Sustainable Dev. (3); & Health & Privacy (1). Structured synthesis of outcomes of the SWOT, trends, etc.

Table 14.5: Scenario development - application of the suggested framework

Finland	Germany	Greece
Three scenarios presented in table format (Problems scenario: King of misery – stagnation; Business as usual: Realistic model; Good case: Utopia – dolce vita for everybody). Delphi results were to be used as background material. No general assumptions have been explicated, though these inevitably must have been implicit. The suggested 'nesting' framework was not used.  'Business as usual' was suggested as the realistic future and analysed in detail. Scenarios for Finland were developed independent of discussion of any external influences.	Three scenarios developed (in table format): Scenario no. 1: Crash: 'Crash into the second league'; Scenario no. 2: Stagnation: 'Business as usual' Scenario no. 3: Change: 'From average to excellence', all (apparently) using the same set of common assumptions, which are discussed extensively.  Scenario no. 3: Change: 'From average to excellence' was chosen as the desired scenario and used as the focus. Scenarios very detailed and quantitative. Suggested framework was not used but the tabular presentation, if used, followed the suggested pattern. Scenarios for Germany within the set of assumptions given.	Three scenarios developed but only two presented as the centre. 'Business as usual' scenario was not included as it has little information content. PREST's suggested framework was used enabling the scenarios to be presented in the context of the wider world and the EU.  Three scenarios (two are presented) were developed to portray 'Awakening' and 'Nightmare' visions for Greece.  Of the two, the 'Awakening' leads to a model of a KS that requires re-orientation of policies, careful design and effectiveness of measures and also radical social changes allied to strong political will. Although it was considered the least realistic, it was believed to be the one that would bring sustainability in Greece's development and would lead to the development of a KS.

Table 14.6: Implementing the scenario analysis

Finland	Germany	Greece
Scenario analysis in terms of LC, WC and IR.	Conducted under the heading of policy and roles of key players. This is the focus of the analysis (as would be expected from an aspirational scenario study). Relatively little focus on LC, WC and IR.	Drew heavily on recent Greek foresight study.

### Scenario analysis and knowledge society foresight

Scenario analysis is the step that follows scenario construction and it aims to identify the policy *ought to* that can be deduced in each scenario. The step takes analysis into deducing or inferring the problems of living that the scenarios reveal. Again, the limitations of the scenarios in the Euforia project that stems from the limited probes of the terrain of a KS make this step more risky than usual.

The scenarios reveal interesting national features. For example, in Germany it was argued that the emphasis of education ought to be changed. In Finland, it is entrepreneurship that ought to be fostered. In Greece it is strong policies for social change that ought to be put in place. From the policy *ought* the next step is to identify the policy instruments according to those issues that lie outside national control, those where there is partial control and those where national control is possible. From these alternative strategies *should be* constructed. If the first purpose of scenarios is to shift perceptions, the second is to enable alternative policies and strategies to be conceived. Such strategies should take conflicting issues into account, and the scenario analysis can help avoiding the situation where policy instruments negate each others' effects.

## Neglected topics

It is good practice in future studies to consider 'wild cards'. However, this is generally taken to refer to events that are possible but unlikely. In the present study forces were noted that are at work globally and are essential components of any KS, but that are ignored widely by humanity, particularly in the developed countries. These are not evident in the Lisbon Declarations, for instance. Some of these forces are:

- public health: this has been highlighted by Garrett<sup>38</sup>, and more recently by Brenner<sup>39</sup> in a potent editorial to a special issue of *Science*. There are warnings from epidemiologists and others that the long period of relative freedom from the most serious consequences of major infectious diseases (associated in particular with better nutrition, vaccination, and the use of antibiotics) may be increasingly fragile;
- another unresolved issue is the long running toxicological debate concerning the effect of long-term exposure of living organisms, human beings especially, to low levels of physiologically and psychologically active chemical residues and radiation. There is a tendency to forget that each human being is an ecological system playing host to millions of minute animals and bacteria, the latter internally and externally, and that interventions in this system can have surprising effects on the individual's well being;
- in a further aspect of a likely KS, many people will be acting as gatekeepers to complex systems that individuals will need access to but may not necessarily understand, especially the depth of information stored within them. The supermarket checkout till is a current example of this kind of system, where the complexity of the system and information stored within it remains hidden;
- until recently one of the least discussed aspects of demography and the current ageing of the populations of the EU 15, is the issue of immigration and its control. Together with crime and terrorist threats, this has led to proposals to use biometric or genetic imprint methods for identification purposes. There is an added incentive to prevent identity theft, which has become an important matter in both crime and immigration control. The economic aspect of immigration is another hotly debated issue, with many commentators arguing for substantial net positive benefits (as well as seeing immigration as a necessary response to population ageing);
- last in this brief review of some of the less obvious characteristics of a KS is globalised crime and its contribution to a nation's or region's GDP (one of the more whimsical aspects of economics). In some countries crime is a major component of economic activity, and the underground economy more generally is prominent in several EU countries. New forms of crime will continue to emerge, and criminals will continue to make use of the capabilities at their disposal - including the tools of the KS.

<sup>38</sup> Garrett, L., *Betrayal of Trust: the collapse of global public health*, Hyperion, New York, 2000.

<sup>39</sup> Brenner, S., *Humanity as the Model System*, *Science*, 302, 24 October, 2003.

All of these matters were touched during the project's probing of the terrain of the future, but we are aware that they have not been seriously tackled in Euforia itself. Many are of such evident importance that it is urgent to undertake foresight and other types of studies to deal with their implications for the European KS.

Some other topics that have been put to one side in the study are discussed above. These include the (very alarming) possibility of a major climate change in Europe, which could have severe implications for the economic and social wellbeing of our societies.

## **The challenges of the knowledge society**

Euforia has contributed to our understanding of the KS, although this is still a somewhat fuzzy and contested concept - which is probably quite appropriate for such an emergent phenomenon. KS is seen as more than the information society, more than the use of information technology. Technology and the knowledge on which it is based are more like critical enabling factors than 'drivers' when considering society as a whole. (This is not to deny that some people may consider the way that other people are using new technology to be an external influence affecting their own lives. Who has not been driven out of public places sometimes by intrusive motors, noise or smoke?)

KS requires social innovation alongside technological change. Institutions and practices must rise to the challenges of social change in general (e.g. demographic change, globalisation, etc.) as well as to change associated with the production and use of new knowledge. The study indicated various points at which social innovation seems to be particularly problematic - for instance, the work-life balance emerged as a recurrent source of concern, there were problems seen in the adaptability of trade unions, the much-heralded network organisations were felt to be slow in developing, ethical considerations were not expected to take a prominent role in working life, and so on. Social innovations, and the social forces to develop, diffuse and implement them, are clearly called for.

What has emerged as particularly salient in Euforia - through the various methods employed in the study - are the capabilities that different societies (and organisations, e.g. firms, public bodies, trade unions) bring to shaping the KS. (The term 'social capital' can be seen as one effort to point to such capabilities - and 'intangible assets' might be another.) Of course actors find themselves in different circumstances. But it is their capabilities to take informed and sustained action in the face of these circumstances that will determine the rates of development towards the KS that they achieve. Furthermore, they will influence the different types of KS that may emerge, and how appropriate it is in terms of contributing to social goals.

Euforia indicates that there are liable to be diverse forms of KS within the EU. While this poses some difficulties in terms of central policies and coordination of decentralised policies, it also represents real strengths and opportunities. There is considerable scope for learning not only about how to achieve objectives, but also about what objectives are worth pursuing. Perhaps this is the most fundamental sort of knowledge that a KS could be creating and acting upon.

## **Foresight approaches to knowledge society**

Many lessons have been learned in the course of this study about the design and conduct of KS foresight. Some concern the general strategy of KS foresight, others are more to do with the implementation of specific methods and tools here.

Euforia suggests that foresight and its methods have roles to play in the emergence of a KS. Foresight procedures can be designed and implemented that will inform policy development and debate - hopefully the results of Euforia are already beginning to do so. Policy action will help shape the KS, and foresight provides an opportunity to reflect on just what sort of KS we are constructing.

Policies can assist and shape developments of a KS. Foresight methods can also help build networks and constituencies that can play roles in effecting change and defining issues deserving further analysis. This can make it more likely that the results and recommendations of the work will be acted upon, 'embedded' within user organisations. Such network-building was a less central element of Euforia than it has been of some other foresight studies, and we would suggest that future projects be designed with this in mind.



**Foresight methods** are valuable tools for examining long-term strategic issues and can be applied effectively to the socio-economic issues surrounding a KS, as well as to the narrower technological issues where they have been applied most often. However, the effort to bring foresight to bear on the problems of a KS requires more than a simple emulation of the specific approaches applied in technology foresight. Many matters that are confronted in all foresight studies are posed very acutely and in quite specific ways here. These include, for instance: the nature of expertise; the ways of recruiting and motivating support; and the ability of people to think in an open-minded, forward-looking manner. However, it is valuable to link KS foresight activities to other foresight activities, including technology foresight, especially where these have sponsorship from national authorities. Being able to make such links influenced participation in the study, experience with themes and methods, and probably the subsequent use of Euforia in the pilot countries.

The dialogue between different national views can provide refreshing insights into a KS, often challenging conventional wisdom. The cross-national workshop held in Euforia resulted in very lively discussions about influences on and of a KS in different regions (including the context of accession countries). It would be possible to design and implement a cross-national workshop that focused more explicitly on variations across Europe, what underpins them and whether these represent opportunities or problems for the EU. Workshops could also be designed to cover (or even focus on) accession countries. As suggested earlier, a focus on diversity of experiences and trends within the EU and the nature of different European KS would be valuable.

**Cross-national studies** proved valuable, but challenging. Consensus needs to be established around a well-structured project plan - which still allows national centres the freedom to approach their work schedules in ways appropriate to local circumstances. Though the foresight process adopted in Euforia drew upon experience from other projects, and the processes and methods used were reasonably well-known ones, there were big differences in the interpretation of these tools across the national teams. Not only did they vary in depth of familiarity, but also their interpretations of the methods and their styles of use were remarkably varied. This was by no means entirely a bad thing, as much could be learned through the interchanges that resulted. But these different working styles and implementation of methods pose challenges for the coordination and synthesis of work. Such challenges will need to be coped with by future managing contractors. One immediate recommendation is that more emphasis on initial training is needed in this sort of project, involving the sponsor as well as the national centres. Another problem, encountered especially in the Delphi study, was that of coordinating translation. This is a sensitive issue, and it should be noted that translation is a time-consuming and costly business - and efforts to get it done fast and on the cheap are liable to meet with disaster.

Workshops with multiple objectives should be avoided, as it is hard to combine multiple objectives. For example, the cross-national workshop had three objectives, namely to be (a) a sounding board about issues; (b) a demonstrator of KS foresight methods and thinking; and (c) a prototype for the use of expert opinion about a KS. This gave rise to problems of management and of explaining to participants precisely what they were involved in. Also, the physical and technical facilities that are required for workshops and conferences differ. If the objectives are to be combined, the relevant mix of facilities is required. If such workshops cannot be avoided for logistic or other reasons, then it is necessary to demarcate clearly the distinct elements in the programme and at the event itself, to provide clearly visible reminders of the type of activity and what the goals are at any point in the process. Sufficient time needs to be allocated to workshop activities, whose demands are not always easy to predict in advance. Important topics are recognised and often these have to be put to one side due to time limitations.

The indicator data proved very useful as a trigger for discussion and a general overview to inform the analyses. Participants in the project workshops had the opportunity to discuss and share their impressions about some particular indicators and about the relationships between different aspects of a KS within their own countries. Having suitable background material for the workshops proved to be a very valuable stimulus to discussion, providing a shared

framework of data and immediate controversies to examine. The results of the comparative studies could be promoted for use in other workshops and similar events that are undertaken in the pilot countries and more widely. Euforia results, while particularly relevant to Foundation concerns, should be stimulating inputs for foresight and other strategic processes in the EU.

Online methods have considerable potential in foresight. Access to the necessary equipment and infrastructure is still very uneven, however. Thus such methods are not effective in some circumstances. Recruitment of participants to such methods proved a major issue. Electronic methods cannot at present substitute for face-to-face contacts for some of the most important foresight processes. And recruitment of people to use Delphi (and similar tools) online needs contact going beyond email, in order to involve sufficient numbers and types of participants. One possibility for future work would be to establish national pools of people with expertise on specific topics, who would be committed to taking part in such a survey.

The workshops contributed in significant ways to deepening the analysis of a KS by adding qualitative depth to the quantitative indicators; suggesting topics and issues that have not so far been covered in indicator analyses; and casting light on different national paths to a KS. Clearly, workshops are important parts of any foresight process and, despite advances in IT systems, there is limited scope for replacing them at present by electronic communications. The intensity of dialogue simply cannot be achieved on a regular basis without face-to-face interaction. The Euforia experience underlines the need to continue using workshops, at least for the immediate future, despite the hype around computer-conferences. Indeed, workshop methods need to be experimented with and codified to a greater degree than is currently the case.

However, there is considerable scope for using decision-support tools in workshops. These need not necessarily be supported by information technology. (The German workshops used a simple paper-based method, which enhanced their output.) But impressive computer-based systems allow for capture of content and enhancement of face-to-face meetings and are beginning to be employed in workshops of various types, often to very good effect. Such tools continue to evolve rapidly, and we believe that they would be well worth exploring in future work on knowledge society foresight. The EU should play a role in promoting the development of such tools, their use and understanding of best practice in using them.

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